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Golden Gate Park Comprehensive Transportation Study

San Francisco Recreation and Park Department

Draft - Phase 1 Report

Jefferson Associates, Inc.
July 1982

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EXECUTIVE SUMMARY

Golden Gate Park, one of the great urban parks in the country, provides numerous activity centers, and areas of natural and landscaped open space within the densely populated area of San Francisco. The popularity of the Park results in heavy use virtually every day of the week by residents and visitors. The Park circulation system with its fifteen miles of roadways, arterial thoroughfares and parking for 5,000 vehicles is distinctly automobile oriented although substantial pedestrian, jogging, bicycling and roller skating use also occurs on the Park roadways.

The San Francisco Department of City Planning identified the need for a plan to alleviate traffic congestion in Golden Gate Park as early as 1951. In 1979, the Park Master Plan Statement of Objectives and Policies was adopted by the San Francisco Recreation and Park Commission. A major objective of the Plan is to minimize vehicular traffic in Golden Gate Park. Pursuant to this objective, the San Francisco Public Utilities Commission obtained assistance from the Metropolitan Transportation Commission in 1981 to fund a Comprehensive Transportation Study for Golden Gate Park. The Study is made up of two phases, Phase I includes a precise documentation of existing traffic conditions and transportation patterns. This information will be used in Phase II to develop a recommended set of transportation options and alternatives for minimizing traffic problems in the Park.

This summary presents the findings of the studies conducted in Phase I. Phase I consisted of five elements: an origin/destination study of park users, a circulation study of traffic flow characteristics, a parking study, a public transit service assessment and a shuttle bus feasibility study. These elements address the major transportation issues facing Golden Gate Park.

TRAFFIC CIRCULATION

Average twenty-four hour weekday traffic volumes for the Park have increased approximately 20 percent over 1971 levels, from 126,000 to 151,000 vehicles per day. Crossover Drive (State Highway 1) is the most heavily travelled Park road, followed by Kennedy Drive and Kezar Drive. Weekday traffic on South Drive ranges from 1,600 to 11,500 vehicles per day. North-south traffic consists of approximately 105,000 vehicles per day; of which 54 percent, or 54,000 vehicles per day, is carried on Crossover Drive. The remainder of north-south traffic is carried mostly on Kezar Drive with 36,000 vehicles per day, and Chain of Lakes Drive East, with 9,200 vehicles per day. John F. Kennedy Drive and South Drive carry the majority of east-west traffic. Total east-west traffic is approximately 26,000 vehicles per day east of Crossover Drive; 16,000 vehicles per day between Crossover Drive and Sunset Boulevard; and approximately 4,600 vehicles per day west of Sunset Boulevard.

Levels of service [1] for the great majority of the workday period is high, estimated at level of service B or better. Weekday level of service is lower on major Park roads, such as Kennedy Drive and South Drive during the 7:30-8:30 a.m. and 4:00-5:00 p.m. commute hours, further illustrating the high volumes of commute and through traffic which use the Park. Weekend level of service is level C or better for most of the weekend, with exception of the hours of 12:00 noon to 4:00 p.m. During this period, traffic congestion typically develops on John F. Kennedy Drive between Conservatory Drive West and Kezar Drive, and South Drive between 9th Avenue and Sunset Boulevard, particularly at the intersection with Crossover Drive. Principle causes of the traffic congestion are the high volumes of traffic entering and exiting the Park; high volumes of pedestrian cross-traffic on South and Kennedy Drives; and drivers searching for curbside parking spaces.

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[1] Level of Service is a broad measure of the effect of traffic flow factors such as traffic volume and speed on a given roadway section of intersection.

The predominant causes of accidents within the Park are excessive speed, and excessive speed for prevailing conditions. Other common causes include inattention to control signs (such as STOP Signs), improper passing, turning, and parking movements, and accidents caused by bicyclists and pedestrians. Six traffic fatalities were recorded in the 6 year period of 1976-1981. The highest accident frequency, i.e. the number of incidents, occurred at major arterials such as Kezar Drive and Waller Street (90 accidents) and Crossover Drive at Park Presidio By-Pass (66 accidents). Although a majority of the accident frequency occurs on arterials or major park roads, the locations with the highest percentage of injury accidents are within the Park at Chain of Lakes Drive East at Kennedy Drive; Middle Drive at Transverse Drive; and Chain of Lakes Drive East at South Drive. This fact is consistent with the high vehicle occupancy associated with recreational driving. The preceding accident data suggests that detailed studies of high priority accident locations should be conducted in Phase II which develop accident reduction measures.

Analysis of the closure of the 6th Avenue entrance/exit at Fulton Street reveals that 32 percent of the 6th Avenue traffic was diverted to 10th Avenue, and 68 percent began using 8th Avenue. The diversion increased daily traffic on 10th Avenue by 1,100 vehicles per day or 17 percent, and by 2,400 vehicles per day at 42 percent on 8th Avenue. In addition, no adverse capacity or other traffic conditions have developed on Fulton Street or John F. Kennedy Drive. Nine accidents have occurred in the area of John F. Kennedy Drive and 6th Avenue through 10th Avenue; however, no reliable comparison can be made to past accident activity due to the short test period of the closure.

ORIGIN/DESTINATION SURVEY

Three surveys were conducted in Phase I by the San Francisco Recreation and Park Department to obtain data on travel patterns of park users such as trip origin, activity purpose and destination, transportation mode, and parking location. The survey effort consisted of a Parkwide direct interview origin/destination survey; a windshield parking survey; and a car stop survey at key access roadways. The results of the windshield and car stop survey are presented in the next sections of this summary. Key findings of the origin/destination surveys are:

- Seventy-one percent of Park users come from locations within the City of San Francisco. Of these total San Francisco residents, forty-five percent reported final trip destinations in the Richmond, Sunset and Panhandle neighborhoods.
- Forty percent of respondents stated their primary activity purpose as walking/sightseeing, followed by running/jogging with 13 percent, and picnicking and sports, each with 12 percent.
- Primary destinations within the Park include the Museums with 32 percent of respondents, followed by other activities with 17 percent, the Academy of Science with 16 percent, and trails and meadows with 12 and 10 percent, respectively.

- Transportation mode choice revealed 61 percent of respondents travelled by automobile, 21 percent walked, 7 percent arrived by public transit, and 6 percent travelled by bicycle.
- Of the 61 percent of the respondents that arrived by automobile, 22 percent parked in the Museum/ Concourse area, 11 percent at the Conservatory, 10 percent at the Children's Playground, 10 percent at Spreckles Lake, and 9 percent each at Stow Lake and the Soccer Field. Approximately 6 percent of the respondents reported parking locations in adjoining neighborhoods.

PARKING

Golden Gate Park has over 5,000 parking spaces along the roadways within the Park and in parking lots scattered throughout the Park. In response to a Park user survey, 50% of the respondents felt there were areas in or adjacent to the Park where parking is a problem.

The heaviest parking occurs in the east end of the Park along Kennedy Drive, South Drive, Middle Drive and within the Concourse. In the west end of the Park, the Riding Academy, Polo Field and Soccer Field lots experienced the heaviest parking use. The demand for parking often exceeds the supply of parking spaces in these areas during the weekends. This results in delays in finding parking, increased traffic congestion and spillover parking on neighborhood streets outside the park as people attempt to park close to the Park facilities they intend to visit. A significant amount of commuters park on Kezar Drive and South Drive and to a lesser degree, on Conservatory Drive during weekdays.

The majority of people responding to the Parkwide direct interview survey agreed that parking along roadways in the Park should be lessened and diverted to parking lots; however, a majority also were against developing more parking lots in the Park. High use of existing, underutilized lots is preferred by the survey respondents. The use of parking fees on selected streets and lots which would lessen parking demands in congested areas was opposed by the majority of people surveyed. If parking were restrained within the Golden Gate Park, one fourth of the people responded that they would park next to the Park and walk to their destination. This would cause increased parking congestion in areas adjacent to the Park. A third of the people said that they would be willing to park at designated areas within the Park and use a shuttle to reach their Park destination.

PUBLIC TRANSIT SERVICE

Public transit service to the vicinity of Golden Gate Park is provided by eleven Muni transit lines. Direct service to facilities within the Park from a variety of areas within the City is, however, limited. Of the eleven transit lines only the 44-O'Shaughnessy with direct service to the Museum and Academy of Sciences stops within the Park. The ten other transit lines stop along roads on the perimeter of the Park.

Public transit was used to travel to Golden Gate Park by 8% of the people responding to the Park user survey. When asked how often public transit would be used to travel to the Museum and Academy of Science if convenient transit service were available from near their home, 73% of the respondents stated they would use transit often or always. Only 14% responded that they would never or rarely use transit to travel from their home to the Concourse area. The strong favorable response reveals a latent demand for convenient transit service to the Museum and Academy of Sciences.

The Muni Five Year Plan recommends several route changes that would affect transit service to Golden Gate Park. The route of the 29-Sunset line has already been changed to pass through the Park along Crossover Drive. The Five Year Plan recommended that the 29 line run through the Park on Chain of Lakes Drive. This change was not implemented due to potential Park impacts that might have resulted.

Within the Five Year Plan, recommendations are also made to reduce the hours of operation of the 7-Haight line, extend the 17-Park Merced line through the Park and add a 73-Lincoln Way line along the south side of the Park, extend the 33-Ashbury line to Arguello Blvd., and re-route the 71-Haight Noriega line to Ninth Avenue. A shortage of direct transit service to Park facilities will still exist if the recommended line changes are carried out. Dialogue between the Recreation and Park Department and the San Francisco Municipal Railway should continue with the intent of improving transit service to the Park, and for assessing the impacts on the Park resulting from possible modifications of the transit improvement recommendations presented in the MUNI Five Year Plan.

SHUTTLE BUS FEASIBILITY

One option being evaluated to help reduce Park traffic and parking congestion is a shuttle bus system for park users. In the past, shuttle services have been operated in the Park for short periods of time. No shuttle services are operating currently.

When Park users were questioned on their attitudes about using a shuttle system, one third of the people expressed a willingness to use a Park shuttle bus. Results from the surveys indicate that from 15% to 20% of the people surveyed would use a frequently operating Park shuttle when accompanied by parking restraints within the Park.

Three initial options for weekend shuttle systems within the Park were evaluated in conjunction with potential parking restraint options. A small East Park shuttle system operating between Kezar Stadium and the Music Concourse would provide transit between an accessible parking area at Kezar Stadium and the Museum, Academy of Sciences and Tea Garden in the Concourse area. With a fleet of four 20-passenger buses, the system would have sufficient capacity to handle the estimated demand. An expanded route option in the East Park would serve Stow Lake in addition to the Concourse area and Kezar Stadium. A system of eight 20-passenger buses would be needed to handle the estimated demand for this route. A Parkwide shuttle system would serve the major activity areas in both the east and west end of the Park. Ten to fifteen buses would be necessary for complete Parkwide service.

Operation of a shuttle service could be handled by Muni, the Department of Recreation and Park, a Park Association, or a private contractor. Each has different operation and cost constraints. A charter shuttle service operated by Muni is the most expensive option and at this time only large diesel buses would be available for use. An extension of an existing Muni route to run along the shuttle route would be less expensive. A shuttle system operated by the Department of Recreation and Park or a Park Association could cost up to 40% less than a charter Muni shuttle system. A chartered private shuttle system could cost 10% less than a Park operated system, and would have high flexibility in vehicle availability and operations. Funding sources for operation of a shuttle system option would require a combination of grants, fees, or subsidies sufficient to cover the costs of operating or contracting the shuttle services.

DIRECTIONS FOR PHASE II

While options for minimizing traffic problems in the Park will not be thoroughly developed until Phase II, Phase I work has revealed certain promising options and transportation management areas which can be investigated or refined in Phase II. These areas are described below.

TRAFFIC CIRCULATION

Weekend manual traffic movement counts, machine line counts, and Level of Service determinations are needed for key intersections before a final analysis of traffic flow conditions within the Park can be made. These counts should be conducted in on both Saturdays and Sundays early in Phase II. Particular emphasis should be devoted to access intersections such as Kennedy Drive at Kezar Drive, Kezar Drive at South Drive, South Drive at Ninth Avenue, Crossover Drive at South Drive, and Kennedy Drive at 8th Avenue and Tea Garden Drive.

The feasibility of a traffic signal at Kezar Drive and Kennedy Drive requires more investigation, both in terms of suitable operation for existing traffic volumes, and coordination with pedestrian crossings of Kennedy Drive.

The feasibility of a grade separation at South Drive and Crossover Drive should be investigated in the long-term. In the short term, restrictions of left turn movements from South Drive during peak weekday and weekend periods should be investigated to alleviate traffic congestion on South Drive.

High priority accident locations identified in Phase I should receive further study to develop appropriate measures which reduce vehicle speed and/or reduce accident potential. Particular emphasis should be placed on low-cost measures that are suitable for the Park environment.

An evaluation of the impacts of closing 8th Avenue at Fulton may be warranted due to opposition to the 6th Avenue closure recorded by Richmond District residents and some public agencies. The impacts of closing other Park roads such as Chain of Lakes Drive, 30th Avenue at Fulton Street, Metson Road, and Bowling Green Drive should be evaluated. Some of these closures may be temporary, or placed in effect during peak use periods.

PARKING

Measures should be identified which direct or rechannel parking demand to underutilized parking areas such as the Stow Lake area, or areas in the western or southern portion of the Park. These measures might consist of a combination of signage, road closures, and provision of parking information at major activity centers, and the Recreation and Park Department offices. In addition, although the Parkwide direct interview survey indicated that road closures, development of new parking lots and assignment of parking fees may generally not be acceptable to Park users, these measures should be carefully evaluated in conjunction with a shuttle bus system.

PUBLIC TRANSIT

Dialogue between the San Francisco Recreation and Park Department and the San Francisco Municipal Railway should continue with the intent of improving transit service to the Park. Impacts of potential changes in transit service to the Park and recommendations presented in the Muni Five Year Plan need to be assessed. Re-routing of the line 44-O'Shaughnessy from Cabrillo Street to Balboa Street should be considered as a means of reducing adverse impacts of bus operation to residents living along Cabrillo Street.

SHUTTLE BUS SYSTEM FEASIBILITY

Three areas of shuttle bus feasibility require more analysis:

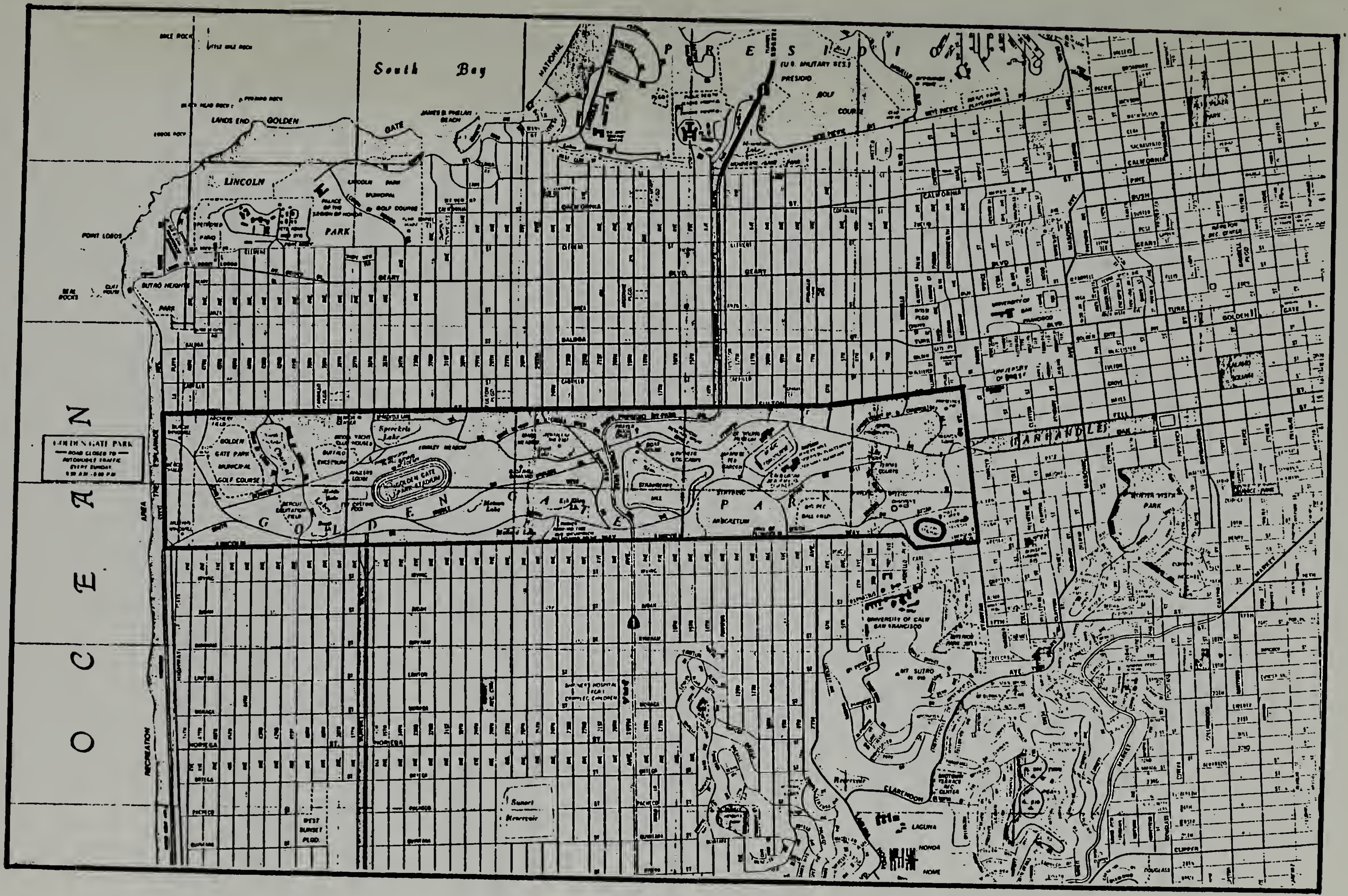
1. Recreation and Park Department staff should pursue the possibility of obtaining State Transportation Development Account (TDA) funding under the assumption that the S. F. Muni may ultimately operate the shuttle system.
2. Associated costs of labor, insurance and vehicle storage of a Park operated shuttle system should be estimated to greater detail.
3. Realistic auto restraint measures which would enhance the feasibility of a shuttle system should be identified.

I. INTRODUCTION

Golden Gate Park is recognized as one of the great urban parks in the United States. The Park provides numerous activity centers, acres of open space, and natural and landscaped greenery in which one may escape the pressures of urban living. The popularity of the Park results in heavy use virtually every day of the week by City residents, residents of the greater San Francisco Bay Area, and tourists from California, other parts of the United States, and foreign countries. The attractive qualities which make the Park unique have resulted in problems due to heavy use such as damaged park grounds, and traffic and parking congestion. This study focuses on the traffic and transportation problems which threaten to undermine the recreational and natural characteristics of the Park, and diminish the quality of the Park experience.

The San Francisco Department of City Planning identified the need for a plan to alleviate traffic congestion in Golden Gate Park as early as 1951. In 1979, the Park Masterplan Statement of Objectives and Policies was adopted by the San Francisco Recreation and Park Commission. A major objective of the Plan is to minimize vehicular traffic in Golden Gate Park. Pursuant to this objective, the San Francisco Public Utilities Commission obtained assistance from the Metropolitan Transportation Commission to fund a Comprehensive Transportation Study for Golden Gate Park. The study is made up of two phases, Phase I includes a precise documentation of existing traffic conditions and transportation patterns. This report presents the findings of the studies conducted in Phase I.

Golden Gate Park has always had a distinct vehicular orientation, as recreational driving with horse and carriage was an integral element of the original park concept. Today, the Park contains nearly fifteen miles of internal automobile roadway, the majority of which are minor roads linking the Park's activity centers. However, the Park's proximity to major traffic generators, such as the University of California and Saint Mary's Hospitals, and the location between the Sunset and Richmond residential



GOLDEN GATE PARK

"Basic map (material) reproduced by permission of the California State Automobile Association,copyright owner."

FIGURE 1

districts results in high volumes of commute and inter-residential traffic on park roadways. Crossover Drive, John F. Kennedy Drive, Kezar Drive, and portions of South Drive function as arterial roadways. During weekdays, commuter parking lines roads in the eastern portion of the Park along South Drive and Conservatory Drive, effectively precluding use of these roads by park users. With increased traffic volumes, conflicts between recreational uses and automobile traffic have intensified, particularly during weekends and peak summer season. Traffic congestion, noise, exhaust emissions, safety conflicts with pedestrians and bicyclists, and increased parking demand in the Park and adjoining neighborhoods, occur regularly during heavy use periods. It is apparent that the existing circulation system conflicts with early planning desires to separate recreational travel from major traffic corridors.

Some steps have already been taken to minimize vehicular travel through and within the Park, and to improve traffic circulation patterns on park roadways. John F. Kennedy Drive, a major vehicle access point to the Park, is regularly closed to automobile traffic on Sundays between the hours of 8:00 a.m. and 6:00 p.m. Tea Garden Drive and Concourse Drive have been converted to one-way roads to improve traffic flow around the Museum/ Concourse area. Overlook Drive has been permanently closed at its intersection with Middle Drive West. Marx Meadow Drive has been removed and is being relandscaped with vegetation, and Sixth Avenue at Fulton Street was closed on a trial basis in December, 1981. Other options for road closures or circulation improvement are being considered.

This report presents the findings of Phase I of the Golden Gate Park Transportation Study. The purpose of Phase I was to collect and analyze data pertaining to existing transportation patterns within the Park. Based on this information, a clear and objective assessment of high priority transportation problems can be made. Options and alternatives to address these problems will be developed in Phase II of the study, culminating in a Final Transportation Plan for Golden Gate Park.

Phase I consists of five distinct elements:

1. An origin/destination study of park user travel patterns.
2. A circulation study of traffic flow characteristics and their impact on internal Park roadways.
3. A parking study to identify parking supply and demand, and parking problem areas.
4. An assessment of public transit service needs in the Park.
5. A feasibility study of an internal shuttle bus system to serve Golden Gate Park exclusively.

The findings of the above studies are presented in the following sections of this report. Section II documents the Study objectives and priorities. The findings of the Origin/Destination study are presented in Section III. Section IV presents the data base for traffic circulation, parking, and public transit. The feasibility study of an internal shuttle bus system is presented in Section V, and the directions for Phase II of the study are summarized in Section VI.

II. STUDY OBJECTIVES AND PRIORITIES

Study objectives and priorities were established in a series of meetings between the Project Coordinator, the Technical Committee and the consultant. A list of Technical Committee members is provided in Appendix B. A review of existing transportation data, and an assessment of objectives and policies contained in the Plan for Golden Gate Park (1979) formed the basis from which study objectives were ranked in order of priority. Objectives and policies pertaining to Golden Gate Park were then submitted to Technical Committee members for priority ranking. These Objectives and Policies are presented in Appendix C. Technical Committee members were instructed to rank individual objectives/policies as High or Low Priority from both a short-term and long-term perspective. The results of this exercise are presented in Appendix D. A summary of the results is presented below.

High priority was assigned to:

- Parking controls - commute and visitor parking with transit service
- Increased transit service to Park
- Restricting vehicular traffic through and within Golden Gate Park
- Removal of non-designated throughways not serving Park facilities
- Maintenance of access to park facilities for internal transport, safety and the elderly and handicapped.

Low priority was assigned to:

- Screening throughways with vegetation
- Spacious energy efficient transit vehicles accessible by the elderly and handicapped
- Transit service to other parks

No consensus was obtained on:

- Provision of grade separations to separate recreational traffic from major corridor traffic
- Provision of a minor naturalistic roadway in the western half of the Park
- Provision of access to major activity areas using narrowed existing roadways
- Regulation of parking in adjoining residential areas
- Development of a transport access program for Golden Gate Park and the Golden Gate National Recreation Area
- Regulation of roadway use to protect the Park's landscaped character
- Siting of tour bus parking areas to minimize environmental impacts

Essentially all high priority objectives and policies identified by the Technical Committee are addressed in this Phase I report. Phase II will involve refinement of options for high priority objectives such as parking controls, increased transit service, traffic regulation, and road closures, and development of feasible alternatives which could be implemented to minimize the effects of traffic on Park use.

III ORIGIN/DESTINATION SURVEY RESULTS

This section presents the findings of three surveys conducted by the San Francisco Recreation and Park Department in April and May of 1982. The survey effort consisted of:

- A Park-wide Direct Interview Origin/Destination Survey
- A Windshield Survey of parked cars
- A Car Stop Survey at key access roadways

The primary purpose of the surveys was to obtain data on travel patterns of park users such as trip origin, activity purpose and destination, transportation mode, time of arrival to the Park, and parking location. The secondary purpose was to obtain information concerning Park user attitudes and perceptions of traffic and parking problems, and possible options which could be implemented to alleviate these problems.

The Park-wide Direct Interview Origin/Destination Survey was conducted on a Saturday, May 8th; a Sunday, April 25th; and a Wednesday, May 5th, 1982. Surveys were conducted for a 6½ hour perioed from 9:00 a.m. to 3:30 p.m. The Car Stop Surveys were conducted on two consecutive weekdays from 7:00 to 9:00 a.m., 12:00 to 2:00 p.m. and 4:00 to 6:00 p.m. The Windshield Parking Survey was conducted during the same days and time periods as the Origin/ Destination surveys.

The origin/destination direct interview survey was administered to a random sample of Park users. A total of 1,198 surveys were completed. Survey interviewers were located throughout the Park, and instructed to survey within their assigned portion or "zone" of the Park. The rate at which Park users were surveyed varied with the estimated Park user volume. For example, high-use locations such as the Museum/Concourse area had a lower sampling rate (every tenth person) compared to the Cahin of Lakes (every third or fourth person). Appendix E contains detailed information on survey procedure and sampling methodology. The key findings of the surveys are presented in the following discussion.

ORIGINS OF PARK USERS

Trip origin data confirms the fact that most of the Park users come from locations within the City of San Francisco. Seventy-one percent of the respondents report starting their trip to the Park from San Francisco. In comparison, 7% report coming from San Mateo County; 3% from Marin County; 6% from Alameda County; 2% from Contra Costa County, 3% from Santa Clara County and 8% from other locations in California and the United States. The data suggests that despite the Park's acknowledged strong attraction for visitors to the City, it is primarily a "backyard" recreational resource to City residents.

DESTINATIONS OF PARK USERS

The survey respondents were asked to provide the zip code of their destination after departing the Park. Survey results show 21% of the respondents report destinations in zip code areas 94118 or 94121. These zip codes correspond to destinations in the Richmond or East Richmond neighborhood. At the same time, 14% report destinations in the Sunset neighborhood zone of 94122, with 10% reporting destinations in the panhandle area of zone 94117. About 5% report destinations in the Potrero Hill area with a similar number reporting destinations in downtown zip code areas. Lake Merced area destinations account for 5% of the responses of the sample.

ACTIVITY PURPOSES

Activity purposes are summarized below in Table 1.

TABLE 1

ACTIVITY PURPOSES

Activity	% of Respondents
Running/jogging	13%
Walking/Sightseeing	40%
Bicyling	7%
Picnicking	12%
Nature Study	3%
Roller Skating	2%
Sports	12%
Other	11%

It is clear from the data that running and walking/sight-seeing account for over 50% of the activity purposes of Park visitors. When walking and sight-seeing are combined with other activities like picnicking and nature study, it is clear that the primary activity purpose of Park users is to utilize the Park as a naturalistic area for a variety of outdoor recreational uses.

PARK ACTIVITY CENTERS

When asked their primary destination within the Park, the choices of all respondents were:

°	Museums	32%
°	Academy of Science	16%
°	Conservatory	6%
°	Tea Garden	4%

Arboretum	3%
Trails	12%
Meadows	10%
Other	17%

FREQUENCY OF VISITS BY RESIDENCY

Table 2 summarizes the frequency of visits by residency. It is apparent that frequency of Park use among City residents is considerably higher than non-residents. Almost 39% of San Francisco residents report using the Park over ten times a month. Less than 5% of non-residents report a comparable frequency of Park use. In a parallel vein, 73% of non-residents report that they visit the Park less than once a month while 14% of the Park visitors who are San Francisco residents report coming to the Park less than once a month.

TABLE 2

	FREQUENCY OF VISITS BY RESIDENCY			
RESIDENCE	LESS THAN ONCE A MO.	1 - 4 TIMES A MONTH	5 - 10 TIMES A MONTH	10 + TIMES A MONTH
San Francisco Resident	14%	27%	21%	39%
Non-Resident	73%	19%	4%	4%

TRANSPORTATION MODE

Transportation mode choice results are as follows:

°	Walk	21%
°	Bicycle	6%
°	Car	61%
°	Cab	1%
°	Public Transit	7%
°	Charter Bus Tour	2%
°	Other	1%
°	Fast Pass	1%

The Transportation Mode Choice results document the strong reliance on the private automobile as the vehicle of choice for travel to Golden Gate Park. Sixty-one percent of all respondents report coming to the Park in a private automobile. This compares with 21% who report walking to the Park. This data confirms what is known on a common sense basis to users of the Park. It is clear that the automobile is the transportation mode of choice and is a major cause of traffic and parking congestion in the Park.

PARKING LOCATIONS

Survey respondents were asked where they entered the Park and where they were surveyed. The various parking locations were classified by zones as shown in Figure 1 of Appendix E, corresponding to Park activity centers and adjacent neighborhoods. The results are shown below in Table 3.

TABLE 3

PARKING LOCATIONS OF VISITORS

Location	Percent of Respondents
Conservatory	11%
Music Concourse	22%
Childrens Playground	10%
Stow Lake	9%
Soccer Field	9%
Chain of Lakes	4%
Spreckles Lake	10%
Polo Field	8%
Speedway Meadows	8%
Elk Glen Meadow	2%
A	1%
B	3%
C	1%
D	1%
E	0
F	0
G	0

Table 3 shows that the Museum/Concourse predominates as the cited parking area for 22% of the respondents. This is followed by the Conservatory with 11%, the Childrens Playground with 10%, the Stow Lake and Soccer Field with 9% each, and the Polo Field and Speedway Meadow with 8% each.

PARKING PROBLEMS

The survey instruments queried Park users on the extent and location of parking problem areas within the Park. Half of the interview sample indicated that they believed that there were parking problems in the Park. Twenty-eight percent of those interviewed reported that there was not a problem. Twenty-one percent of the respondents indicated that they did not know if there was a parking problem in the Park.

Park user perceptions of the most severe parking problems are documented in Table 4. The responses to this question parallel the findings of travel behavior research in other settings. The principal concern of Park users is that it is difficult to find a space. This is the parking problem reported as the primary concern by over 75% of the respondents answering this question. The other concern which is articulated by over 10% of the sample is that parking problems lead to increased congestion within the Park.

TABLE 4

USER PERCEPTIONS OF PARKING PROBLEMS

Response	Percent of Respondents
Hard to find space	78%
Contributes to Congestion	11%
Noisy	5%
Unsightly	3%
Contributes to Accidents	2%
Damages Park Grounds	1%
Other	-

DEMOGRAPHICS OF PARK USERS

The sex ratio of Park users is relatively balanced for a public recreation area. Fifty-six percent of the respondents were male while 46% of the respondents were female. Adults, persons between the ages of 20 and

65, outnumbered the portion of users who were children or teens, or senior citizens. 77% of the visitors were adults, 14% were senior citizens, and 9% of the respondents were children or teens.

ETHNICITY

Ethnicity of the sample showed that:

- 14% were Asian
- 6% were Black
- 5% were Spanish American
- 71% were Caucasion or White and
- 3% were Other

It is clear the substantial majority of Park users are white with a significant sub-population of Asian users.

IV. EXISTING CIRCULATION, PARKING AND PUBLIC TRANSIT CONDITIONS

A. TRAFFIC CONDITIONS

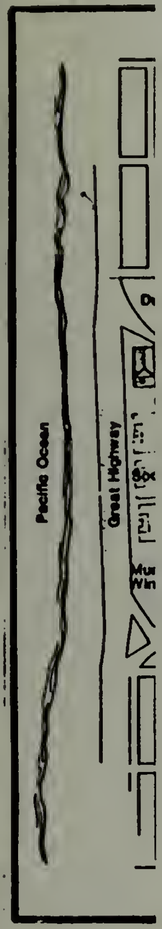
The overall effect of vehicular traffic on the environment and use of the Park is a major concern of the San Francisco Recreation and Park Department, park users, and residents of adjoining neighborhoods. This section presents the traffic circulation data base for the Park. Included is a general overview of traffic circulation, and its component parts:

- Traffic volumes
- Levels of service for selected intersections, and
- Accident characteristics

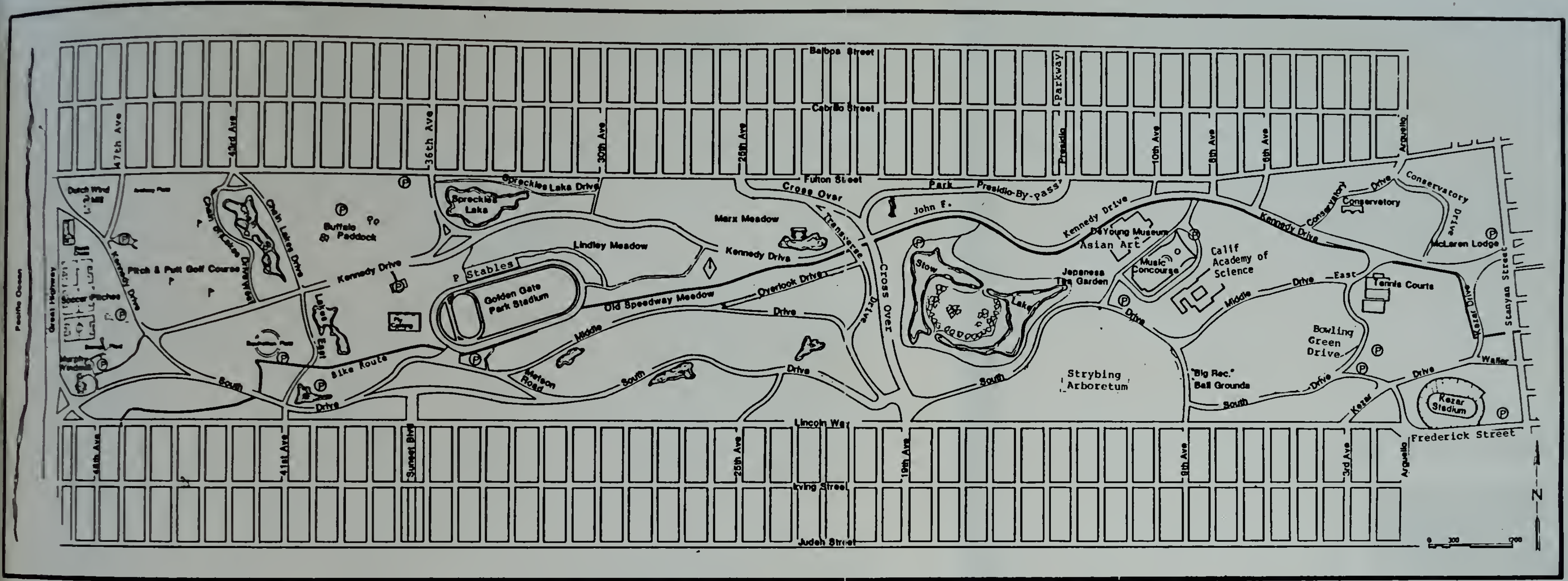
Data for this section were obtained from Recreation and Park Department sources; the Department of Public Works, Division of Traffic Engineering; and direct field observations by the consultant.

Golden Gate Park contains approximately fifteen miles of automobile roadway. The existing roadway system is shown in Figure 2. Major intersections which provide vehicle access to the Park include:

- John F. Kennedy Drive at Stanyan Street
- 9th Avenue at Lincoln Way
- 19th Avenue and Lincoln Way
- 25th Avenue at Lincoln Way
- Sunset Boulevard at Lincoln Way
- 41st Avenue at Lincoln Way
- South Drive and John F. Kennedy Drive at the Great Highway
- 43rd Avenue at Fulton Street
- 25th Avenue at Fulton Street and
- 8th Avenue at Fulton Street



Weekday traffic in the west park is relatively light when compared to the east park traffic. Recreational travel primarily occurs on Kennedy Drive and South Drive, and limited commute and north-south through traffic occurs on Chain of Lakes Drive East.



EXISTING ROADWAY SYSTEM GOLDEN GATE PARK

FIGURE 2

Minor intersections, in terms of traffic volumes, include:

- Waller Street at Stanyan Street
- 7th Avenue at Lincoln Way
- 47th Avenue at Fulton Street
- 36th and 30th Avenues at Fulton Street
- 10th Avenue at Fulton Street, and
- Arguello Boulevard at Fulton Street

Park road widths range from 18 feet for minor roads such as Chain of Lakes Drive West, to 95 feet for major roadway segments such as Kennedy Drive at Kezar Drive. Major throughways include Crossover Drive, (State Highway 1), Kezar Drive, John F. Kennedy Drive, South Drive, and Chain of Lakes Drive East. Median speeds on major roadways range from 29 to 37 mph. Speeds up to 55 mph have been recorded on lesser travelled sections of South Drive and Kennedy Drive in the western portion of the Park.

Most park roads provide direct vehicles access to major activity centers such as the Museum/Concourse area, the Polo Field, Stow Lake, and Lindley Meadow. As a result, park roads are used by several modes of transportation. Autos, tour buses, bicyclists, pedestrians, joggers, equestrians, and roller skaters are frequently sighted on park roads.

Park traffic conditions exhibit distinct differences during weekdays compared to weekends. On weekdays, most of the traffic within the Park occurs in the east Park area, east of Crossover Drive. Traffic is concentrated on Kezar Drive which serves commute traffic, and on Kennedy Drive, South Drive, and minor roads which provide access to major activity centers such as the Museum/Concourse area. In addition, the majority of MUNI and tour bus traffic occurs in the east Park.

Weekday traffic in the west park is relatively light when compared to the east park traffic. Recreational travel primarily occurs on Kennedy Drive and South Drive, and limited commute and north-south through traffic occurs on Chain of Lakes Drive East.

Weekend traffic patterns are markedly different from weekday patterns. Traffic volumes on west Park roadways, for example, increase substantially and reflect the high weekend demand for group recreational facilities at Lindley Meadow, the Stadium/Polo Field, soccer field, and golf course. Considerable traffic volumes and demand for curbside parking are generated along South Drive, Kennedy Drive and Middle Drive East. The eastern portion of the Park experiences increased weekend traffic due to larger volumes of visitors at the Museum/Concourse, Conservatory, Stow Lake and the Big Recreation Grounds. Weekend traffic congestion becomes severe during the afternoon hours between 1:00 and 4:00 p.m. coinciding with the large volumes of visitors entering and exiting the Park. Areas in which traffic congestion typically develops include:

- Kennedy Drive between Conservatory Drive and Kezar Drive
- South Drive and the 9th Avenue exit near Lincoln Way
- South Drive at Kezar Drive and
- South Drive at Crossover Drive

TRAFFIC VOLUMES

Twenty-four hour traffic volumes for internal park roadways and selected peripheral locations are shown in Figure 3, and summarized in Section F-1 of Appendix F. Total average daily traffic (ADT) for the Park is estimated at 151,000 vehicles per day. This represents an increase of 25,000 vehicles per day, or 20% over the estimated 126,000 ADT in 1971.[1] Crossover Drive is the most heavily traveled Park road with 59,000 vehicles per day, followed by Kennedy Drive and Kezar Drive at approximately 38,000 and 36,000 vehicles per day, respectively. Traffic on South Drive ranges from roughly 1,600 to 11,500 vehicles per day.

The majority of north-south traffic is carried on Crossover Drive, Kezar Drive, and Chain of Lakes Drive East. A significant number of

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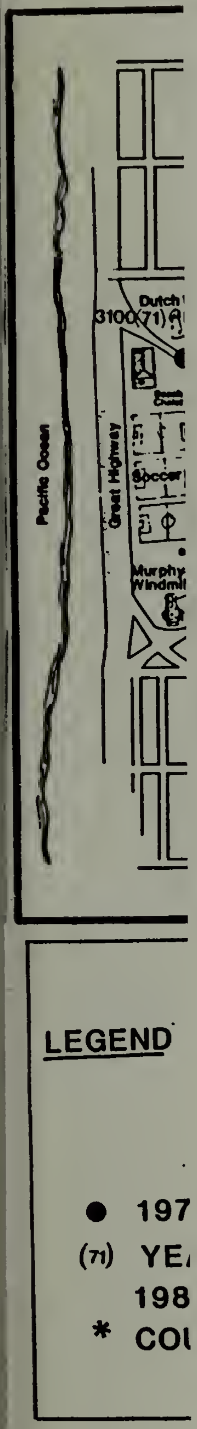
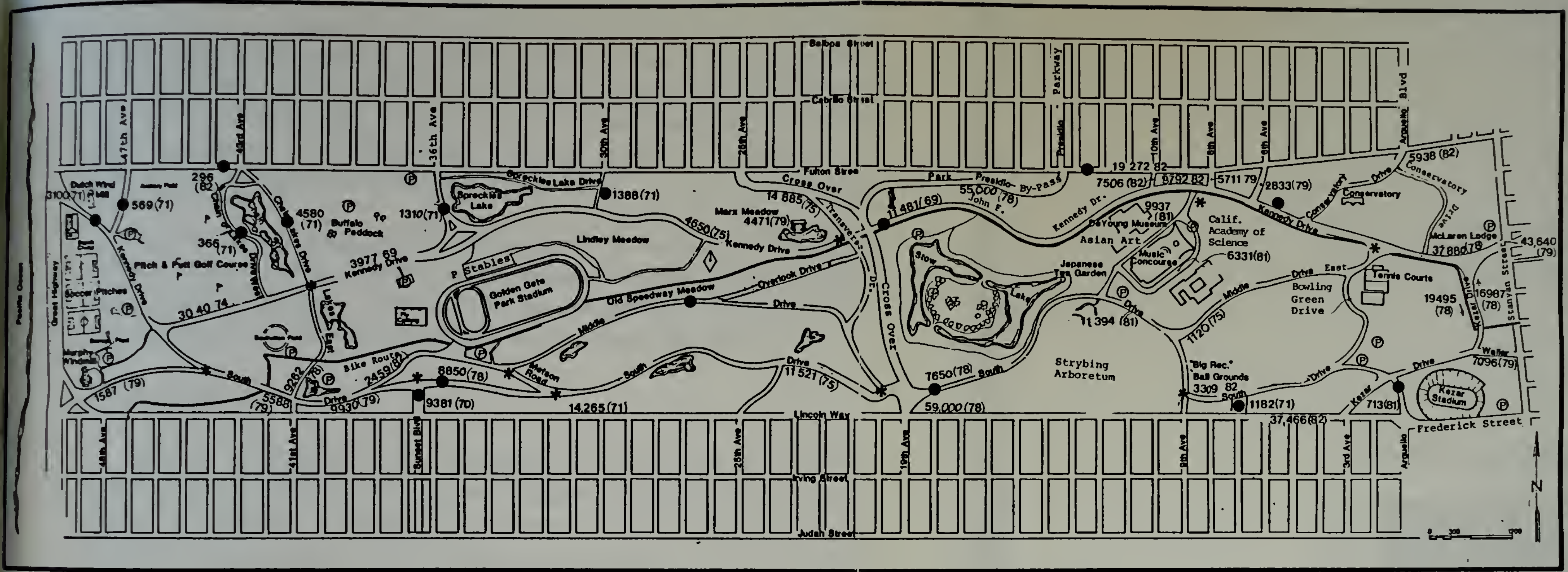
[1] Golden Gate Park Traffic Study, San Francisco, California, Department of Public Works, Division of Traffic Engineering, July, 1971



[illegible]

- ° Kennedy Drive at Kezar Drive
- ° Kennedy Drive at Middle Drive East and
- ° South Drive at Chain of Lakes Drive East
- ° South Drive at 25th Avenue



TWENTY -FOUR HOUR TRAFFIC VOLUMES

LEGEND

● 1971 Count Location

(71) YEAR COUNT WAS TAKEN

* 1982 MANUAL TURNING MOVEMENT COUNT LOCATION

FIGURE 3

morning commuters also use a circuitous north-south route from 8th Avenue at Fulton Street, along Tea Garden Drive, South Drive, to 9th Avenue and Lincoln Way. North-south traffic consists of approximately 105,000 vehicles per day of which 56% (59,000 vehicles) travel on Crossover Drive prior to its divergence from Park Presidio By-Pass.

John F. Kennedy Drive and South Drive carry the majority of east-west traffic. Total east-west traffic is approximately 27,000 vehicles per day east of Crossover Drive; 16,000 vehicles per day east of Sunset Boulevard, and approximately 6,000 vehicles per day west of Sunset Boulevard.

LEVELS OF SERVICE

Priority intersections were identified for manual turning movement counts based on their traffic volumes, accident history, or relevance to existing or planned circulation improvements. These intersections are identified with an asterisk (*) in Figure 3 and include:

- Kennedy Drive at South Fork of Kennedy Drive (north of South Drive)
- Chain of Lakes Drive East at Kennedy Drive
- Sunset Boulevard at South Drive
- Middle Drive West at Metson Road
- South Drive at Transverse Drive
- Crossover Drive at South Drive
- Kennedy Drive at Transverse Drive
- Crossover Drive at Park Presidio By-Pass
- Kennedy Drive at Tea Garden Drive
- South Drive at Metson Road
- South Drive near 9th Avenue
- Kennedy Drive at Kezar Drive
- Kennedy Drive at Middle Drive East and
- South Drive at Chain of Lakes Drive East
- South Drive at 25th Avenue

TABLE 5

LEVELS OF SERVICE FOR URBAN AND SUBURBAN ARTERIAL STREETS

LEVEL OF SERVICE	DESCRIPTION
A	Free flow (relatively). If signalized, conditions are such that no approach phase is fully utilized by traffic and no vehicle waits through more than one red indication. Very slight or no delay.
B	Stable flow. If signalized, an occasional approach phase is fully utilized; vehicle platoons are formed. This level is suitable operation for rural design purposes. Slight delay.
C	Stable flow or operation. If signalized, drivers occasionally may have to wait through more than one red indication. This level is suitable operation for urban design purposes. Acceptable delay.
D	Approaching unstable flow or operation; queues develop, but are quickly cleared. Tolerable delay.
E	Unstable flow or operation; the intersection has reached ultimate capacity; this condition is not uncommon in peak hours. Congestion and intolerable delay.
F	Forced flow or operation. Intersection operates below capacity. Jammed.

Source: Highway Capacity Manual, HRB Special Report 87

Many of the intersections analyzed within the Park are either uncontrolled with no signage or pavement messages, or are four-way STOP controlled. The methodology for determination of capacity level of service at these types of intersections is not well defined. Nevertheless, since some approximate measure of level of service of key Park intersections is desired, the following assumptions were used for the purposes of this study:

- Existing uncontrolled intersections were assumed to have YIELD control on the minor roads.
- The major road traffic has no controls, and is not affected by minor road movements.
- Two phase signalization was assigned to existing four-way STOP controlled intersections.

The capacity and levels of service for key intersections are presented in Table 6. Calculations for each intersection are provided in Appendix F.

From Table 6 it becomes clear that the majority of the intersections reviewed are characterized by relatively high levels of service. In general, level of service is B or better throughout the majority of an average weekday, with the exception of the peak a.m. and p.m. commute hours. Similarly, traffic congestion during weekends typically develops between 12:00 noon and 4:00 p.m.

Although such intersections as Chain of Lakes Drive East at Kennedy Drive, Transverse Drive at Kennedy Drive and South Drive at Chain of Lakes Drive East possess relatively high weekday peak traffic volumes compared to other park intersections, the associated twenty-four hour volumes do not warrant signalization. The John F. Kennedy Drive at Kezar Drive intersection is perhaps the only intersection which could warrant a traffic signal due to high daily traffic and pedestrian volumes. The Traffic Engineering Division of the Department of Public Works is currently studying the possibility of installing a traffic signal at this intersection.

TABLE 6

WEEKDAY LEVEL OF SERVICE FOR SELECTED INTERSECTIONS

LOCATION	TYPE OF INTERSECTION	TIME	APPROACH	LEVEL OF SERVICE*		
				R. TURN	L. TURN	INTERSECTION
1. Kennedy Drive at south fork of Kennedy (north of South Drive)	Skewed T	4:00 - 5:00 PM	South fork of Kennedy Dr. Kennedy Dr.	A ---	B A	--- ---
2. Chain of Lakes Dr. East at Kennedy	4-Way Stop	4:15 - 5:15 PM	---	---	---	A
3. Sunset Blvd. at South Drive	T	7:15 - 8:15 AM	Sunset Blvd. South Dr.	B ---	C A	--- ---
4. Middle Dr. West at Metson Rd.	Skewed T	7:15 - 8:15 AM	Metson Rd. Middle Dr.	A ---	A A	--- ---
5. South Dr. at Transverse Dr.	Skewed T	7:40 - 8:40 AM	Transverse Dr. South Dr.	A ---	E A	--- ---
6. Crossover Dr. at South Dr. (A)	4-Way Signal	4:00 - 5:00 PM	---	---	---	C
7. Kennedy Dr. at Transverse Dr.	4-Way Stop	7:35 - 8:35 AM	---	---	---	A
8. Crossover Dr. at Park Presidio By-Pass (A)	4-Way Signal	4:00 - 5:00 PM	---	---	---	C
9. Kennedy Dr. at Tea Garden Dr. (B)	T	4:45 - 5:45 PM	Tea Garden Dr. Kennedy Dr.	B ---	E D	--- ---

(A) CalTrans Traffic Operations 1982
(B) Weekend (Saturday) count

*Estimate reflects level of service for specific turning movements, with existing traffic controls, instead of controls assumed for the purposes of using the Critical Movement Analysis Method for determination of level of service.

TABLE 6 (CONTD)

WEEKDAY LEVEL OF SERVICE FOR SELECTED INTERSECTIONS

					LEVEL OF SERVICE*	
LOCATION	TYPE OF INTERSECTION	TIME	APPROACH	R. TURN	L. TURN	INTERSECTION
10. South Dr. at Metson Rd.	Skewed T	7:25 - 8:25 AM	Metson Rd.	B	B	---
			South Dr.	---	A	---
11. South Dr. near	Skewed T	7:40 - 8:40 AM	South Dr.	---	A	---
			South Dr. (east fork)	A	A	---
*12. Kennedy Dr. at Kezar Dr. (C)			---	---	---	N/A
13. Kennedy Dr. at Middle Dr. East	T	4:35 - 5:35 PM	Middle Dr. Kennedy Dr.	E	E	---
14. South Dr. at Chain of Lakes Dr. East	4-Way Stop	7:30 - 8:30 AM	---	---	---	A
15. South Dr. at 25th Ave.	T	4:40 - 5:40 PM	25th Ave.	C	C	---
			South Dr.	---	B	---

(C) Level of service not available pending completion of signalization study by S.F. Division of Traffic Engineering.

*Estimate reflects level of service for specific turning movements, with existing traffic controls, instead of controls assumed for the purposes of using the Critical Movement Analysis Method for determination of level of service.

For each intersection, manual turning movement counts were used to determine the occurence of the peak hour, and associated peak hour volume. The results of the manual counts are presented in Section F-2 in Appendix F. These results were then used to determine level of service for each intersection approach.

Intersection approach capacity is generally defined as the maximum number of vehicles which can be accommodated on the given section of the intersection approach, under prevailing roadway and traffic conditions. Capacity is usually presented in units of hourly volume.

Level of service is a broad measure of the effect of a number of traffic flow factors such as traffic volume, speed, traffic flow conflicts, and traffic controls on a given roadway section or intersection approach. Level of service may vary widely for a given location, particularly where traffic volumes exhibit distinct peaking characteristics such as in Golden Gate Park. From a driver perspective, higher levels of service are associated with lower traffic flow rates or volumes. Table 5 presents the level of service designations widely used for urban intersections.

The method to determine level of service employed in this study is the Critical Movement Analysis contained in the Transportation Research Circular Number 212. [2]

The Critical Movement Analysis allows for analysis of both signalized and unsignalized intersections as an entire unit. As a result, the overall intersection level of service and the impacts on level of service due to operational and design changes can be determined. Direct application of the Critical Movement Analysis is limited to signalized intersections, or unsignalized intersections controlled by STOP or YIELD signs. It is not directly applicable to uncontrolled intersections or four-way STOP intersections.

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[2] Transportation Research Circular Number 212, Transportation Research Board, National Academy of Sciences, January, 1980

It should be noted that the Level of Service determinations presented in this report were based on weekday traffic data to develop a clear representation of peak period weekday traffic conditions. Because weekend traffic conditions differ from weekday conditions in peak volumes, geographic and temporal distribution, it is essential that thorough weekend traffic counts are conducted early in Phase II. Data collected from this task would allow for an accurate assessment of the impacts resulting from options and alternatives developed to address transportation problems.

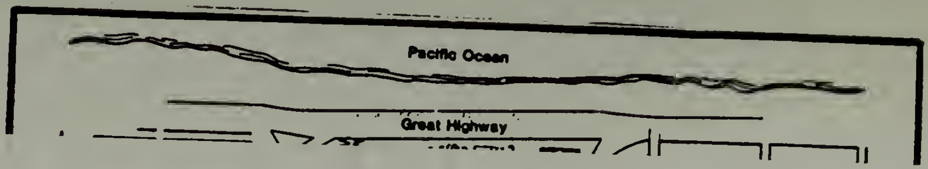
ACCIDENT CHARACTERISTICS

The accident data for this section were obtained from the City Traffic Department, and Recreation and Park Department files. Locations involving seven accidents or more during the six year period from 1976-1981, were analyzed for accident frequency, accident type, and severity (the number of persons injured or killed). A total of thirty Park locations, shown in Figure 4, were reviewed. A summary of the accident characteristics for each location is presented in Table 7. Appendix G contains a summary of accident frequency and severity for peripheral intersections which provide access to the Park.

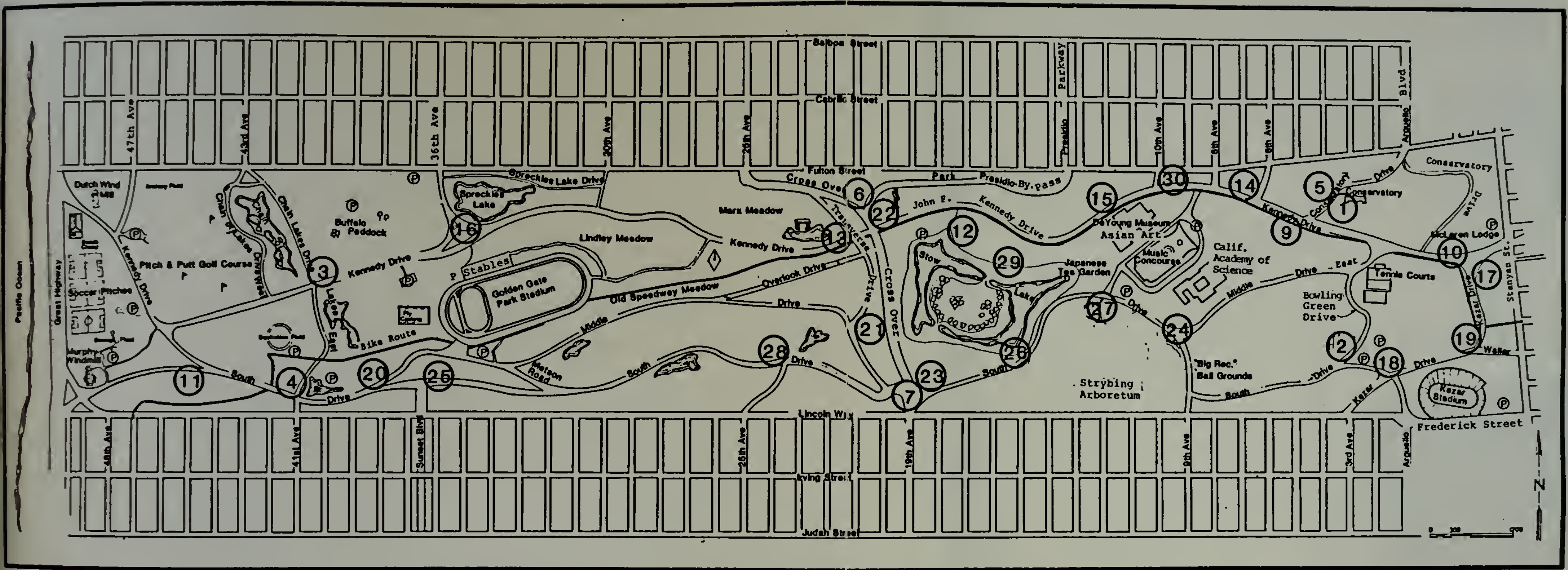
The predominant causes of accidents within the Park are excessive speed, and excessive speed for prevailing traffic conditions. Other common causes include disobedience of control signs, improper passing, turning and parking movements, and accidents caused by bicyclists and pedestrians. A total of six traffic fatalities were recorded in the six year period.

Accident frequency, rate and ranking are shown for each study location in Table 8. The highest accident frequency occured at Kezar Drive and Waller Street (90 accidents) followed by Crossover Drive and Park Presidio By-Pass (66), Crossover Drive at South Drive (52), Kezar Drive at South Drive (44), and Park Presidio By-Pass at Crossover Drive (44).

When viewed in terms of accident rate per million entering vehicles (MEV), the highest accident rates were obtained at Middle Drive West at South Drive (4.64), followed by South Drive at Middle Drive East (4.08), Kezar Drive at Waller Street (2.11), Crossover Drive at Park Presidio



LOCATION	Ri An
1. Arguello Blvd. at Kennedy Drive	
2. Bowling Green Dr. at South Drive	
3. Chain of Lakes Dr. at Kennedy Dr.	
4. Chain of Lakes Dr. at South Dr.	
5. Conservatory Dr. at Kennedy Dr.	
6. Crossover Dr. at Park Presido By-Pass	
7. Crossover Dr. at South Avenue	
8. Crossover Dr. at 25th Avenue	



INTERNAL ACCIDENT LOCATIONS

SEE TABLE 7 FOR PRECISE LOCATIONS

FIGURE 4

TABLE 7

ACCIDENTS BY TYPE AND SEVERITY
(Internal Park Locations Only)

LOCATION	ACCIDENT TYPE												SEVERITY	
	Right Angle	Left Turn	Right Turn	Rear End	Side Swipe	Ped.	Bike	Parked Car	Stopped in Traffic	Head On	Other	TOTAL	Injury	Fatality
1. Arguello Blvd. at Kennedy Drive	1	4	-	-	-	-	-	1	2	-	-	8	5	-
2. Bowling Green Dr. at South Drive	-	-	-	1	-	-	3	1	1	-	1	7	7	-
3. Chain of Lakes Dr. at Kennedy Dr.	-	1	-	-	2	1	1	-	1	3	3	12	21	-
4. Chain of Lakes Dr. at South Dr.	1	1	-	-	3	-	1	-	-	4	4	14	14	-
5. Conservatory Dr. at Kennedy Dr.	-	-	-	2	1	-	-	4	1	-	4	12	0	-
6. Crossover Dr. at Park Presido By-Pass	1	13	1	9	6	-	-	-	26	1	9	66	56	1
7. Crossover Dr. at South Avenue	6	11	2	6	5	2	-	1	13	-	6	52	66	-
8. Crossover Dr. at 25th Avenue	-	-	-	2	4	-	1	1	9	-	4	21	14	-

TABLE 7

ACCIDENTS BY TYPE AND SEVERITY
(Internal Park Locations Only)

LOCATION	ACCIDENT TYPE												SEVERITY	
	Right Angle	Left Turn	Right Turn	Rear End	Side Swipe	Ped.	Bike	Parked Car	Stopped in Traffic	Head On	Other	TOTAL	Injury	Fatality
9. Kennedy Dr. at Conservatory Dr.	-	-	-	2	-	1	2	4	-	-	-	9	7	1
10. Kennedy Dr. at Kezar Dr.	4	14	-	1	5	-	1	-	3	2	2	32	17	-
11. Kennedy Dr. at South Dr.	3	5	-	-	-	2	-	1	-	2	1	14	7	-
12. Kennedy Dr. at Stow Lake Drive	-	-	-	-	-	1	-	3	1	1	2	8	7	-
13. Kennedy Dr. at Transverse Dr.	2	-	1	-	2	1	3	4	2	-	6	21	12	2
14. Kennedy Dr. at 6th Avenue	-	-	-	-	1	-	-	3	1	-	3	8	4	-
15. Kennedy Dr. at 10th Avenue	-	-	-	-	2	1	1	3	2	1	7	17	11	-
16. Kennedy Dr. at 36th Avenue	-	-	-	-	2	2	4	1	1	-	2	12	8	-

TABLE 7

ACCIDENTS BY TYPE AND SEVERITY
(Internal Park Locations Only)

LOCATION	ACCIDENT TYPE												SEVERITY	
	Right Angle	Left Turn	Right Turn	Rear End	Side Swipe	Ped.	Bike	Parked Car	Stopped in Traffic	Head On	Other	TOTAL	Injury	Fatality
17. Kezar Dr. at Kennedy Dr.	-	-	-	1	3	-	1	2	2	-	19	28	19	-
18. Kezar Dr. at South Dr.	1	3	-	4	3	2	-	10	9	-	12	44	31	-
19. Kezar Dr. at Waller St.	7	9	-	8	16	1	-	10	7	1	31	90	42	-
20. Middle Dr. west at South Dr.	-	1	5	-	1	3	1	4	-	1	9	25	18	-
21. Middle Dr. at Transverse Dr.	1	-	-	-	1	-	-	1	-	-	5	8	12	-
22. Park Presidio By-Pass at Crossover	-	-	-	5	5	-	-	-	18	-	16	44	32	-
23. South Dr. at Crossover Dr.	-	1	-	-	3	2	-	1	4	-	7	18	5	-
24. South Dr. at Middle Dr.	-	-	-	-	1	-	-	4	1	1	3	10	5	-

TABLE 7

ACCIDENTS BY TYPE AND SEVERITY
(Internal Park Locations Only)

LOCATION	ACCIDENT TYPE												SEVERITY	
	Right Angle	Left Turn	Right Turn	Rear End	Side Swipe	Ped.	Bike	Parked Car	Stopped in Traffic	Head On	Other	TOTAL	Injury	Fatality
25. South Dr. at Sunset Blvd.	1	-	-	1	3	-	4	-	1	2	11	23	14	-
26. South Dr. at Stow Lake Dr.	2	-	-	1	3	1	1	2	-	2	4	16	5	-
27. South Dr. at Tea Garden Dr.	-	-	-	-	1	1	1	2	1	1	3	10	8	-
28. South Dr. at 25th Ave.	-	-	-	-	4	-	1	1	2	1	6	15	9	1
29. Stow Lake Drive	-	-	-	-	-	-	1	3	1	-	4	9	2	1
30. 10th Ave. at Kennedy Dr.	-	1	-	-	-	-	2	1	3	1	1	9	6	-

TABLE 8

ACCIDENT FREQUENCY AND RATES

LOCATION	ACCIDENTS 1976-1981	24-HOUR VOLUME	ACCIDENT RATE (MEV)*	RANKING BY FREQUENCY	/ RATE
1. Arguello Blvd. at Kennedy Dr.	8	5,936	0.62	26	15
2. Bowling Green Dr. at South Dr.	7	N/A	--	30	--
3. Chain of Lakes Dr. at Kennedy Dr.	12	9,262	0.59	18	16
4. Chain of Lakes Dr. at South Dr.	14	9,262	1.38	16	5
5. Conservatory Dr. at Kennedy Dr.	12	5,936	0.92	19	11
6. Crossover Dr. at Park Presidio By-Pass	66	14,885	2.02	2	4
7. Crossover Dr. at South Dr.	52	58,274	0.42	3	20
8. Crossover Dr. at 25th Ave.	21	14,885	0.64	10	14
9. Kennedy Dr. at Conservatory Dr.	9	19,356	0.21	23	25
10. Kennedy Dr. at Kezar Dr.	32	37,880	0.39	6	22
11. Kennedy Dr. at South Dr.	14	N/A	--	17	--
12. Kennedy Dr. at Stow Lake Dr.	8	7,996	0.46	27	19
13. Kennedy Dr. at Transverse Dr.	21	11,481	0.84	11	12
14. Kennedy Dr. at 6th Ave.	8	19,356	0.19	28	26
15. Kennedy Dr. at 10th Ave.	17	9,792	0.79	13	13

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*Million Entering Vehicles (MEV)

TABLE 8

ACCIDENT FREQUENCY AND RATES
(continued)

LOCATION	ACCIDENTS 1976-1981	24-HOUR VOLUME	ACCIDENT RATE (MEV)*	RANKING BY FREQUENCY /	RATE
16. Kennedy Dr. at 36th Ave.	12	4,650	1.18	20	7
17. Kezar Dr. at Kennedy Dr.	28	36,482	0.35	7	24
18. Kezar Dr. at South Dr.	44	19,495	1.03	4	9
19. Kezar Dr. at Waller St.	90	19,495	2.11	1	3
20. Middle Dr. West at South Dr.	25	2,459	4.64	8	1
21. Middle Dr. at Transverse Dr.	18	N/A	--	29	--
22. Park Presidio By-Pass at Crossover Dr.	44	55,000	0.37	5	23
23. South Dr. at Crossover Dr.	18	7,650	1.07	12	8
24. South Dr. at Middle Dr.	10	1,120	4.08	21	2
25. South Dr. at Sunset Blvd.	23	8,850	1.19	9	6
26. South Dr. at Stow Lake Dr.	16	7,650	0.96	14	10
27. South Dr. at Tea Garden Dr.	10	11,394	0.40	22	21
28. South Dr. at 25th Ave.	15	11,521	0.59	15	17
29. Stow Lake Dr.	9	N/A	--	24	--
30. 10th Ave.	9	7,506	0.55	25	18

---

*Million Entering Vehicles (MEV)

By-Pass (2.02), and Chain of Lakes Drive at South Drive (1.38). Table 9 presents a summary of locations which had ten or more injury accidents during the 1976-81 study period. The top five injury producers of those sites within the Park are Crossover Drive at South Drive; Crossover Drive at Park Presidio By-Pass; Kezar Drive at Waller Street; Park Presidio at Crossover Drive and Kezar Drive at South Drive with 66, 57, 42, 32 and 31 injury accidents, respectively.

The high vehicle occupancy associated with recreational driving is reflected in the high percentage of injury accidents that have occurred. Table 10 shows that 26 of the 30 Park locations studied had 50% or more of their accident frequency as injury accidents. The intersections of Chain of Lakes Drive at Kennedy Drive; Middle Drive at Transverse Drive; Crossover Drive at South Drive; Bowling Green Drive at South Drive and Chain of Lakes Drive at South Drive exhibited the highest percentages of injury accidents with 175, 150, 127, 100 and 100% respectively. This indicates that although a majority of the accident frequency occurs on arterials such as Crossover Drive and Kezar Drive, the locations with the highest percentage of injury accidents are within the Park, on smaller Park roads. It is apparent that these and other locations should be considered high priority locations for more study in Phase II. Detailed recommendations for the reduction in accident potential, such as warning signage, lighting facilities, re-painting of lane striping, or additional enforcement should be developed for each high priority site. Special attention should be devoted to speed reduction measures on South Drive and John F. Kennedy Drive, west of Crossover Drive.

B. PARKING ISSUES ANALYSIS

There are several possible parking issues and problems in the Park. When parking demand exceeds supply, park users experience delays and frustration in locating a place to park. This condition also contributes to traffic congestion and accidents while searching for parking. Depending on how far users park from their ultimate destinations, they also may experience bothersome delays or inconveniences in getting themselves and carry items to destinations. When demand exceeds supply, there is also the danger of spillover problems. Parkers may damage the park environment by parking in areas not suitable to parking, or they may park on neighborhood streets, making it difficult for residents to find parking. As demand approaches or exceeds supply, the sheer volume of parked vehicles may be

TABLE 9

HIGH FREQUENCY OF INJURY ACCIDENTS
(Ten Injuries of More)

LOCATION		1976-1981 Accident TOTAL	INJURY	RANK
3.	Chain of Lakes Dr. at Kennedy Dr.	12	21	6
4.	Chain of Lakes Dr. at South Dr.	14	14	10
6.	Crossover Dr. at Park Presidio By-Pass	66	57(a)	2
7.	Crossover Dr. at South Dr.	52	66	1
8.	Crossover Dr. at 25th Ave.	21	14	11
10.	Kennedy Dr. at Kezar Dr.	32	17	9
13.	Kennedy Dr. at Transverse Dr.	21	14(b)	12
15.	Kennedy Dr. at 10th Ave.	17	17	15
17.	Kezar Dr. at Kennedy Dr.	28	19	7
18.	Kezar Dr. at South Dr.	44	31	5
19.	Kezar Dr. at Waller St.	90	42	3
20.	Middle Dr. West at South Dr.	25	18	8
21.	Middle Dr. at Transverse Dr.	8	12	14
22.	Park Presidio at Crossover Dr.	44	32	4
25.	South Dr. at Sunset Blvd.	23	14	13

(a) Includes one fatality

(b) Includes two fatalities

TABLE 10
HIGH PERCENTAGE OF INJURY ACCIDENTS
(50% or more)

LOCATION	1976-1981 Accident TOTAL	INJURY	RANK
1. Arguello Blvd. at Kennedy Dr.	8	63	18
2. Bowling Green Dr. at South Dr.	7	100	4
3. Chain of Lakes Dr. at Kennedy Dr.	12	175	1
4. Chain of Lakes Dr. at South Dr.	14	100	5
6. Crossover Dr. at Park Presidio By-Pass	66	85	7
7. Crossover Dr. at South Dr.	52	127	3
8. Crossover Dr. at 25th Ave.	21	67	14
9. Kennedy Dr. at Conservatory Dr.	9	78	9
10. Kennedy Dr. at Kezar Dr.	32	53	22
11. Kennedy Dr. at South Dr.	14	50	23
12. Kennedy Dr. at Stow Lake Dr.	8	88	6
13. Kennedy Dr. at Transverse Dr.	21	57	21
14. Kennedy Dr. at Sixth Ave.	8	50	24
15. Kennedy Dr. at Tenth Ave.	17	65	17
16. Kennedy Dr. at 36th Ave.	12	67	15
17. Kezar Dr. at Kennedy Dr.	28	68	13
18. Kezar Dr. at South Dr.	44	70	12
19. Kezar Dr. at Waller St.	90	47	26
20. Middle Dr. West at South Dr.	25	72	11
21. Middle Dr. at Transverse Dr.	8	150	2
22. Park Presidio at Crossover Dr.	44	73	10
24. South Dr. at Middle Dr. East	10	50	25
25. South Dr. at Sunset Blvd.	23	61	19
27. South Dr. at Tea Garden Dr.	10	80	8
28. South Dr. at 25th Ave.	15	60	20
30. Tenth Ave. at Kennedy Dr.	9	67	16

unsightly to visitors. Finally, there is the issue of commuter parking in the Park. Some people park in the park and then walk or ride the bus to work. Depending on when and where commuters park in the Park, and their numbers, they may make it difficult for park visitors to park. In small numbers, commuter vehicles probably do not present any aesthetic or environmental harm, but large numbers of commuter vehicles might present such problems.

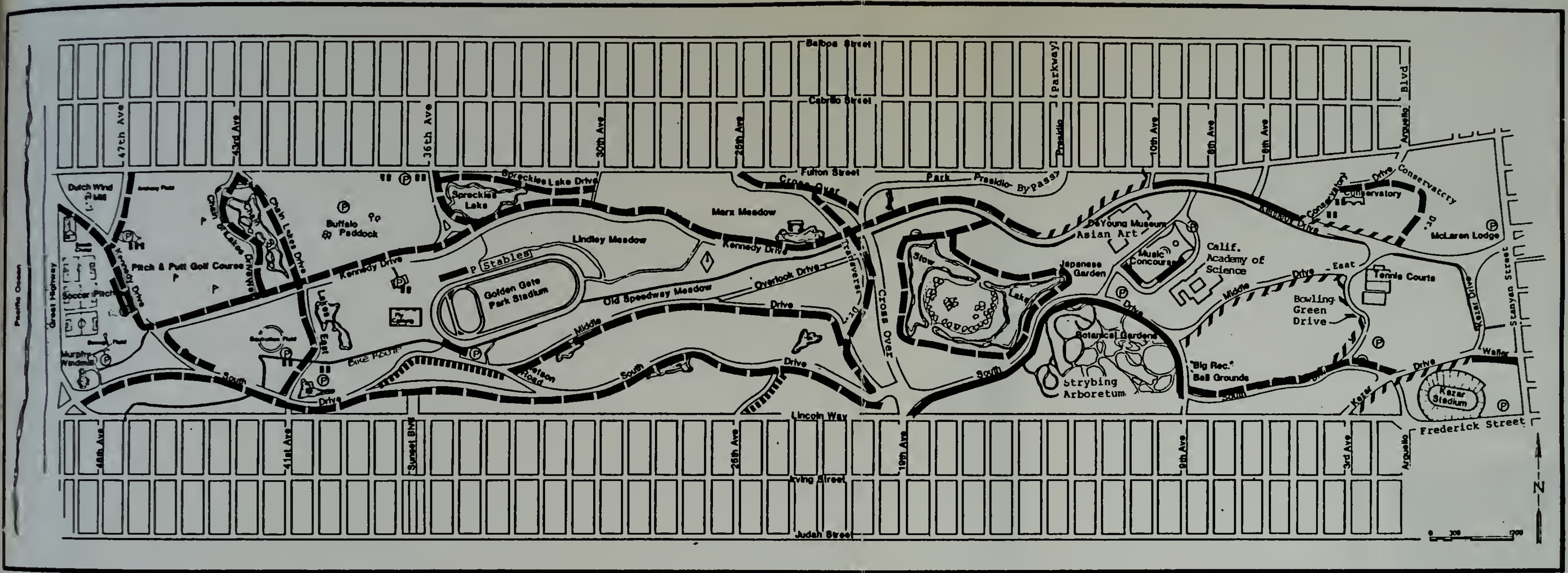
The parking analysis as part of Phase I of the study addresses these issues in several ways. One, relying on data collected by Park staff, we have summarized where demand meets or exceeds supply for weekend days surveyed. Park users and staff are well aware of these areas by experience, but it is important to identify and quantify the parking situation as precisely as possible. We have also reviewed and summarized data, collected by Park staff and volunteers indicating where Park users park on streets near the Park, and the extent to which such parking demand meets or exceeds supply. Two, relying on preliminary data collected through the Jefferson Associates Survey of park users in the spring of 1982, we have assessed how users view parking problems and their possible reactions to alleviating these problems.

PARKING DEMAND/SUPPLY ISSUES

Traffic and Parking studies show streets and lots have an effective capacity below the raw number of space or stalls. As a general rule, if on street parking spaces are 85% occupied and off street surface lots are 90% occupied, they are said to be used to capacity. Beyond these occupancies drivers experience considerable delays and frustration in finding space, whereas below these occupancies drivers will find space in an acceptable amount of time. Thus, demand and supply are balanced at the occupancies, and demand may be said to exceed supply beyond these occupancies.

Figures 5 and 6 show parking occupancies on a sunny, warm Saturday and Sunday, midday, for both east and west park. Several important points emerge. First, demand effectively exceeds supply on Saturday along a portion of Kennedy Drive (Conservatory to Tenth) and South Drive (Crossover Drive to 9th Avenue), and at the boat house lot, Music Temple Lot and Concourse lot in the east end of the Park. In the west end, in only a few

The issue of park users on streets in neighborhoods is difficult to assess. The only data we could locate on the issue is contained in a survey of neighborhoods near the park done by a graduate student. The student counted vehicles from 7:00 to 8:30 a.m. on a Saturday in May, 1982 and compared the result to a count done between 1:30 and 3:00 p.m. on a



PARKING OCCUPANCY - MIDDAY SATURDAY HOURS

LEGEND

▬▬ 85%

⁄⁄⁄⁄⁄ 70-85%

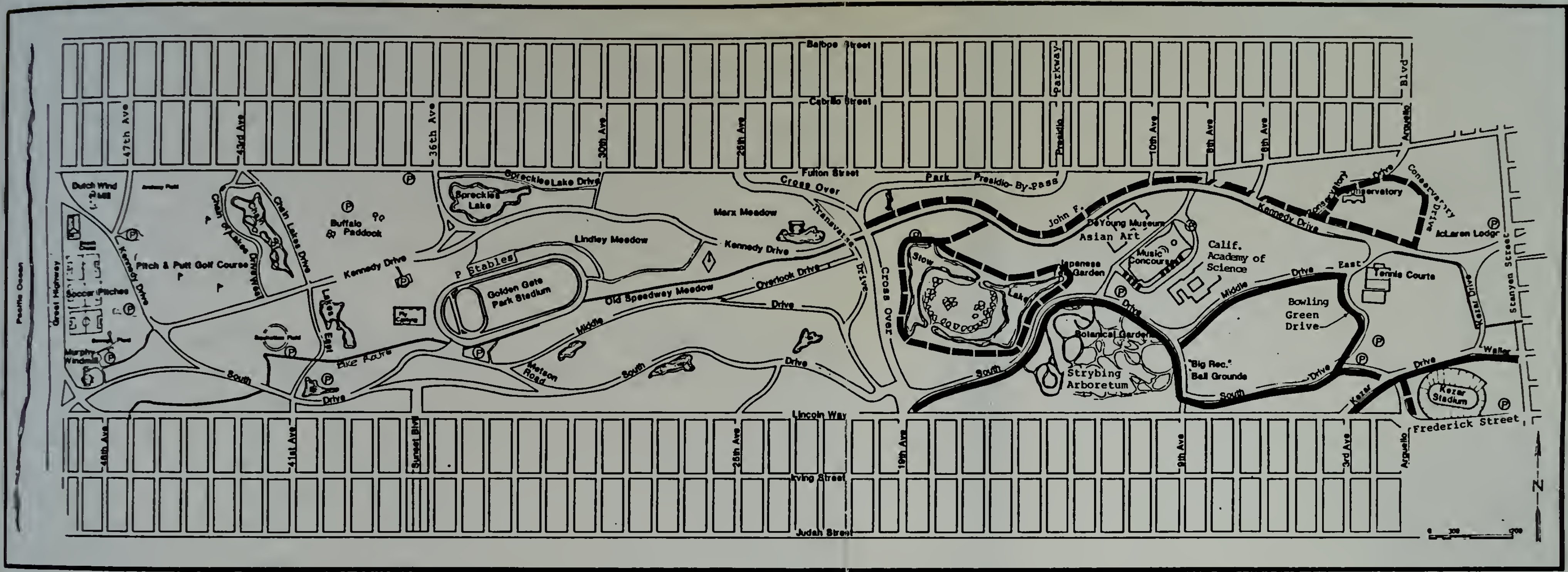
ıııııııı 55-70%

▬ ▬ ▬ 0-55%

12-3pm SATURDAY SEPTEMBER 1981

FIGURE 5

The issue of park users on streets in neighborhoods is difficult to assess. The only data we could locate on the issue is contained in a survey of neighborhoods near the park done by a graduate student. The student counted vehicles from 7:00 to 8:30 a.m. on a Saturday in May, 1982 and compared the result to a count done between 1:30 and 3:00 p.m. on a



PARKING OCCUPANCY – MIDDAY SUNDAY HOURS

LEGEND

━━ 85%

⁄⁄⁄⁄70-85%

▮▮▮▮▮55-70%

▬ ▬ ▬ 0-55%

12-3pm SUNDAY OCTOBER 1981

FIGURE 6

lots does demand exceed supply. These include lots at the Soccer Field, Riding Academy and Polo Field. Elsewhere, in the west end, demand is generally well below supply, with occupancies below 55% or between 55% and 70%. Secondly, on Sunday, demand effectively exceeds supply along a greater portion of South Drive, and on Middle Drive, Kezar Drive and Bowling Green Drive. Sunday occupancies on South Drive, Kezar Drive and Waller range from 97% to 100%, meaning demand excessively exceeds supply. Finally, on both Saturday and Sunday, occupancies around Stow Lake -- except at the Boat House lot -- are below 55% in spite of heavy parking demand in the immediate vicinity.

It is possible to quantify the degree to which demand exceeds supply, at least in terms of occupany criteria. Assuming demand and supply are balanced at 85% occupancies on streets, and actual occupancies were found to be at least 97% on the roads exceeding 85% occupancies, then demand exceeds supply by at least 12% for these roads. This means demand and supply might be balanced if space could be found for 100-200 vehicles. Two cautions are important to interpreting the result. First, balancing demand and supply by creating an 85% occupancy rate does not mean there would be no delay in finding parking, or a major reduction in parked vehicles or traffic. It only means delays would be reduced to more usual and acceptable levels, but demand for on street parking would continue. Secondly, there is latent demand for parking in the park, meaning removing 200 parked vehicles to create more tolerable parking will probably attract vehicles now parked in neighborhoods around the Park. In spite of these cautions, it is important to point out that shifting some vehicles to currently underutilized areas may help parking conditions on the most heavily used roads. The most obvious underutilized areas in east Park are the drives around Stow Lake where there are about 386 spaces, only about 100 of which are utilized at peak periods.

The issue of park users on streets in neighborhoods is difficult to assess. The only data we could locate on the issue is contained in a survey of neighborhoods near the park done by a graduate student. The student counted vehicles from 7:00 to 8:30 a.m. on a Saturday in May, 1982 and compared the result to a count done between 1:30 and 3:00 p.m. on a

Saturday and Sunday, also in May, 1981. The presumption is that the difference in counts represents an estimate of parking by park users. While this is an imperfect means of measuring park user demand for parking, it does give a very rough sense of possible demand. The paper suggests there might be 50-100 park user vehicles on Fulton Street from Arguello Blvd to 11th Avenue on a typical weekend. For Lincoln Way, park user demand appears from about Tenth Avenue eastward, representing possibly another 50 cars. On the streets leading off Fulton and Lincoln, there might be another 150 park visitor vehicles. The total might be 300 vehicles. As previously suggested, this number of vehicles represents a significant latent demand for parking within the park, should spaces free up there by shifting vehicles to underutilized parking areas.

Another important finding comes from the graduate student survey. For those neighborhood streets where park users presumably are parking, the streets do fill to capacity between the early morning and mid-afternoon counts. If the demand filling these streets to capacity is made up of park users, then these users are creating a difficult situation for residents trying to park there.

PERCEPTIONS OF PARK USERS

A survey of Park users conducted by Jefferson Associates in the spring of 1982 addressed several parking issues. Analysis of survey results is ongoing, but several important results are now available.

Park users perceive parking problems, but not in overwhelming proportions. Fifty percent of respondents indicate yes to the question, "Are there any areas in or adjacent to the Park where you feel parking is a problem?" Yet, 28% indicate there is not and 21% do not know. Of course, since 27% of park users arrive on foot or by bike, it may be these are the respondents for whom parking is not a problem. Further analysis will tell. The point is parking is seen as a problem by half the respondents and possibly a higher proportion of auto users. When asked to identify the primary parking problem, 78% of the respondents indicate, "hard to find a space", while less that 15% indicate the problem is related to safety, noise, congestion or unsightliness. Thus, the main parking problem appears to be one of inconvenience in locating a place to park rather than the environmental and safety or traffic consequences of parking. As for the location of the problem, 42% put the problem at the Concourse, with the next largest proportion of respondents (16%) indicating "everywhere".

The park user survey also assessed reactions to ways parking might be reduced, at least when and where demand is excessive. Fifty-nine percent of users agree or strongly agree with the statement, "if more off street parking lots were available in the Park and more streets were closed to parking, my enjoyment of the scenic beauty of the park . . . . would increase." However, while agreeing with this general statement, user reactions differ when several specifics are unraveled. Users do not want new parking lots developed in the park. Fifty-four percent disagree with the proposition, "develop new car lots in the park" as a way to reduce parking on streets in the park. Nor do users want park streets closed and converted to parking areas. Forty-nine percent disagree with this idea, though 50% agree or are neutral. However, 74% agree to "direct visitors to park lots not now used."

Other ideas were proposed to visitors for reducing parking in the Park. Parking fees might reduce parking demand in the Park, particularly if combined with shuttle service. However, 65% opposed the idea of charging a fee for parking for selected Park streets. Likewise, 68% opposed a toll for entering the Park, and only 5% of respondents said they would pay a $3.00 per day parking fee. Generally, users appear more sympathetic to road closures or bans than to fees or tolls as a means of restraining auto use. Fifty-one percent support a ban on parking on select Park streets.

Finally, users were asked to predict their behavior under auto restraint schemes. The results point to the need to control parking around the Park should any restraint be put into place. This is true for commuters and recreational users. Under a parking ban on South Drive, Middle Drive and Kezar Drive, with frequent shuttle service in place, 28% of the respondents say they would park next to the Park and walk into the Park. Thirty-three percent claim they would take the shuttle, though experience with shuttles in recreational areas suggests this is an optimistic prediction. Under a parking fee of $3.00 per day, nearly the same percent predict parking outside the Park and taking the shuttle. The windshield survey suggests similar results. People parked in the Park to get to work indicate parking prohibitions would force them to park elsewhere in the Park or on streets around the Park. Forty-seven percent indicate they would park elsewhere and 39% say they would park on streets outside the Park. In sum, visitors to the Park want less parking on streets in the Park, but prefer using existing lots to reduce street parking rather than develop new lots or converting streets into lots.

C. PUBLIC TRANSIT SERVICE

EXISTING SERVICE

Eleven San Francisco MUNI transit lines, shown in Figure 7, operate within the vicinity of Golden Gate Park. Table 11 presents a summary of the access provided by each line and their associated frequency of service. Of these eleven lines, only the 7-Haight and 44-O'Shaughnessy provide direct access to activity centers within the Park. The 7-Haight serves activity centers in the southeast section of the Park near Kezar Stadium at Stanyan and Waller Streets. The 44-O'Shaughnessy provides direct service to the Museum/ Concourse area by way of 8th Avenue, Tea Garden Drive, Concourse Drive, South Drive and 9th Avenue. Lines 5-Fulton, 18-46th Avenue, 21-Hayes, 28 -19th Avenue, 29-Sunset, 33-Ashbury and 71-Haight-Noriega provide indirect park access at stops located along the permimeter roads of Fulton Street, the Great Highway, Lincoln Way and Stanyan Street. The two express routes, lines 16X-Noriega Express and 72X Sunset Express provide weekday peak period service only, and do not stop within the Park. Indirect access is provided by these lines via stops on Lincoln Way.

FUTURE SERVICE

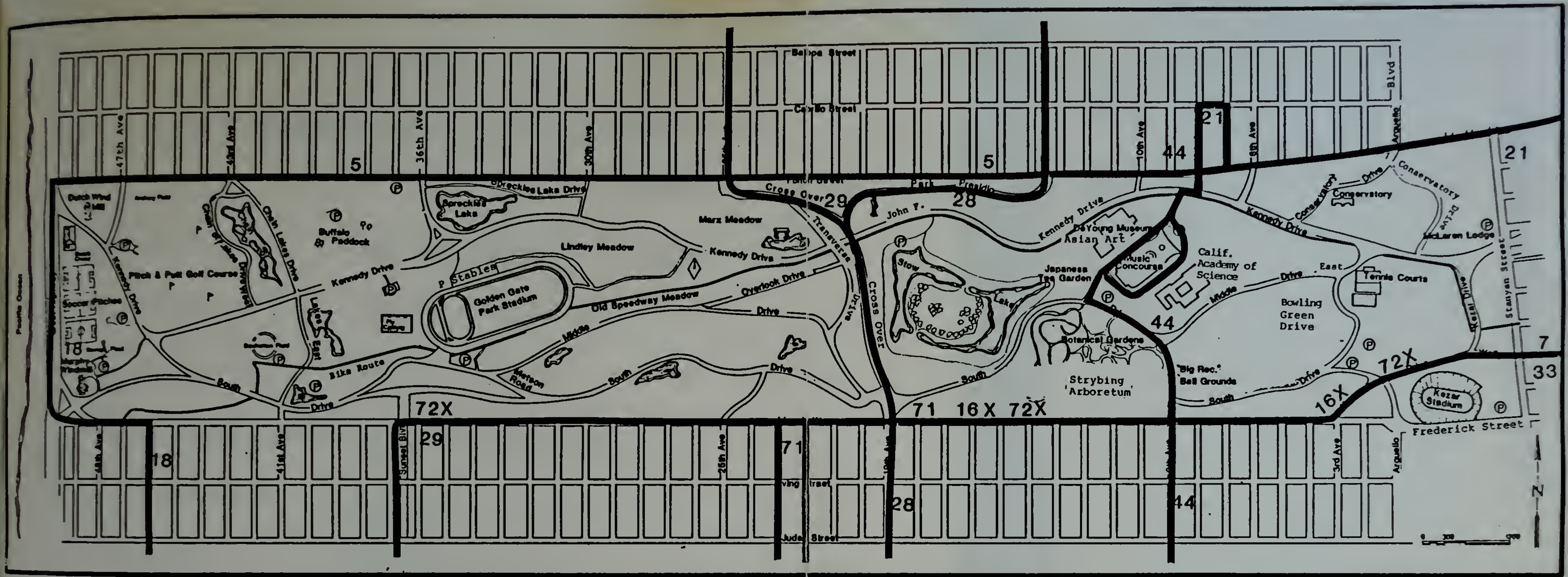
The MUNI Five Year Plan recommends several route changes to improve crosstown and radial service, and service within the Richmond and Sunset Districts. The most significant changes involve the lines 44-O'Shaughnessy and 7-Haight.

It is recommended that the 44-O'Shaughnessy's northern entrance/exit to the Park be moved from 8th Avenue and Fulton to 6th Avenue. This would require re-opening of 6th Avenue to vehicle traffic and possible closure of 8th Avenue. Since 6th Avenue has undergone a temporary closure and is presently considered a candidate for permanent closure, this route change would effectively alter one existing measure for reduction of vehicular traffic within the Park.

VICE*

					Sun.
					9
					-
					-
					15
					15
					15
					15
					20
					10
					15
11.	72-Sunset Express+	Indirect, via Lincoln Way	10	-	-

*Weekday 9:00 a.m. to 4:00 p.m.; Weekend, 9:00 a.m. to 6:00 p.m.
+Express route, weekday peak period service only.



EXISTING PUBLIC TRANSIT SERVICE

LEGEND

5	FULTON
7	HAIGHT
16X	NORIEGA EXPRESS
18	46TH AVE
21	HAYES
28	19TH AVE
29	SUNSET
33	ASHBURY
44	O'SHAUGHNESSY
71	HAIGHT - NORIEGA
72X	SUNSET EXPRESS

FIGURE 7

TABLE 11

SAN FRANCISCO MUNI TRANSIT LINES SERVING GOLDEN GATE PARK

LINE	PARK ACCESS PROVIDED	FREQUENCY OF SERVICE* (Minutes) Weekdays	Sat.	Sun.
1. 5-Fulton	Indirect, via Fulton St.	7	8	9
2. 7-Haight	Direct, at Waller St.	10	10	-
3. 16X Noriega Express+	Indirect, via Lincoln Way	5	-	-
4. 18-46th Avenue	Indirect, via Great Highway	15	15	15
5. 21-Hayes	Indirect, via Fulton St. and Hayes St.	8	15	15
6. 28-19th Avenue	Indirect, via Lincoln Way and Fulton St.	10	15	15
7. 29-Sunset	Indirect, via Lincoln Way	15	15	15
8. 33-Ashbury	Indirect, via Stanyan	20	20	20
9. 44-O'Shaughnessy	Direct, via Stanyan	10	10	10
10. 71-Haight Noriega	Indirect, via Lincoln Way	15	15	15
11. 72-Sunset Express+	Indirect, via Lincoln Way	10	-	-

*Weekday 9:00 a.m. to 4:00 p.m.; Weekend, 9:00 a.m. to 6:00 p.m.
+Express route, weekday peak period service only.

The 7-Haight line service could be reduced from the present daytime service Monday through Saturday, to weekday rush hour only, and all day Saturday. Weekday midday service would possibly be retained on Haight Street if needed. Other recommended changes for transit lines in the Park vicinity include:

- Elimination of Line 16X Noriega Express.
- Extension of Line 17-Park Merced from its present terminus at West Portal Station through the Sunset District, and Golden Gate Park along Crossover Drive to 25th Avenue.
- Addition of a new Line 73-Lincoln Way, for service on Lincoln Way to 20th Avenue.
- Re-routing the southern portion of Line 71-Haight-Noriega from 22nd and 23rd Avenues to 9th Avenue.
- Extension of the existing 33-Ashbury line from its present terminus at Stanyan and Waller Streets, to form a new crosstown line, Line 33-Stanyan, to Arguello Blvd.

D. ANALYSIS OF SIXTH AVENUE CLOSURE

The Sixth Avenue Park entrance at Fulton Street was closed to vehicular traffic on a trial basis on November 23, 1981. The closure is consistent with a major objective of the Plan for Golden Gate Park officials to minimize vehicular traffic within the Park. The trial closure was implemented after a Final Negative Declaration was adopted and issued by the Department of City Planning on July 7, 1981. The preliminary traffic impacts of the closure are as follows:

- Twenty-four hour traffic volume counts taken on 8th and 10th Avenues south of Fulton Street showed that approximately 32% of the 6th Avenue traffic was diverted to 10th Avenue, and 68% began using 8th Avenue. The diversion increased traffic on 10th Avenue from 6,400 to 7,500 vehicles per day or 17%, and from 5,700 to 8,100 vehicles per day or 42%, on 8th Avenue. Field observations indicate that no adverse capacity or other traffic conditions have developed on Fulton Street or John F. Kennedy Drive.

- Accident records reviewed from January through May, 1982, reveal that nine accidents have occurred in the area of John F. Kennedy Drive and 6th Avenue through 10th Avenue. No reliable comparison to past accident activity can be made from the current 1982 accident frequency, however, due to the short test period of the closure.

The closure of the Sixth Avenue entrance/exit to the Park has not been without controversy. Despite receiving a Negative Declaration from the Department of City Planning, some opposition to the closure has been received from residents of the Richmond District along Eighth Avenue and Cabrillo Street, the San Francisco Muni and the Department of Public Works; however, public testimony presented at a June 24th, 1982 special meeting of the Parks and Planning Committee consisted of fourteen individuals in support of the Sixth Avenue closure, eight individuals in opposition to the closure, and one individual who recommended that the alternative closure of Eighth Avenue be further explored.

The possible closure of Eighth Avenue received a Final Negative Declaration in April, 1980. Proponents for the closure of Eighth Avenue cite the following reasons:

- Adverse environmental and traffic safety impacts have developed on Eighth Avenue and Cabrillo Street since the closure of Sixth Avenue.

- Closure of Eighth Avenue at Kennedy Drive would alleviate potentially hazardous turning movements from Eighth Avenue along Kennedy Drive to Tea Garden Drive.

- Comparatively better traffic circulation along Sixth Avenue and Fulton Street is provided by the existing traffic signal at Sixth Avenue and Fulton Street.

- Traffic congestion develops on westbound Fulton Street due to difficult left turn movements by autos from Fulton Street into Eighth Avenue.

- Closure of Sixth Avenue conflicts with the Muni Five Year Plan recommendation to re-route the Line 44-O'Shaughnessy from the Eighth Avenue entrance/exit to Sixth Avenue to improve north-south crosstown service.

As stated earlier, preliminary data suggests that closure of Sixth Avenue has not resulted in adverse traffic or safety impacts on Kennedy Drive or Fulton Street. When viewed in terms of enhancing the Park environment and experience, the closure of Sixth Avenue is consistent with the Park plan to minimize vehicular traffic, and its policy to close unnecessary roads.

Given the apparent support of the general public for closure of Sixth Avenue, two alternatives for improving traffic conditions resulting from use of the Eighth Avenue entrance/exit should be investigated. In the short term, re-routing of the line 44-O'Shaughnessy from Cabrillo Street to Balboa Street should be investigated. This is due to the comparatively higher traffic volumes already present on Balboa Street, and its history of previous transit operations. In the long term, intersection improvements which provide direct alignment of Eighth Avenue with Tea Garden Drive, and eliminate the existing potentially hazardous turning movements on Kennedy Drive should be considered.

V. SHUTTLE BUS FEASIBILITY ANALYSIS

One of the options for reducing traffic and parking congestion within Golden Gate Park is a shuttle bus system for transport of Park users within the Park. Issues affecting the feasibility of a shuttle bus system include:

- Potential peak period demand and capacity requirements
- Auto restraint measures which might enhance the viability of a shuttle, such as road closures and parking restrictions.
- Capital, operation and maintenance costs.
- Available funding sources and possible financing arrangements, and
- Possible operating agency or association.

Other important issues include the type of transit vehicle, operating hours and efficient routes.

For purposes of exploring these issues, three options are presented ranging from a small to large system. These are strictly illustrative options intended to make evident certain information and issues. No single option is recommended, nor are all the issues for each option presented. The options are intended to generate discussion and to focus the work on shuttles which is to continue in Phase Two of the study.

The options are presented in combination with certain auto restraint measures to focus attention on how restraints and shuttles might work together. This has been done for the following reasons:

- General experience with shuttles in recreational areas, as well as the experience of the Golden Gate Park shuttles in 1978, suggests auto restraints are important to encouraging use of shuttles. Without auto restraints, be they time restrictions, physical barriers or pricing measures, shuttle usage is likely to be quite limited.

- The park user survey contained in this study indicates possible demand for the shuttle assuming it is accompanied by auto restraints. Possible demand is translated into capacity requirements for the options, which serves to illustrate issues of cost and operations. At this stage, only auto users provide the basis for projecting shuttle demand. Since most park users arrive by car, this is a useful way to proceed until survey results reveal more about shuttle demand from people arriving by bus, bike or on foot.

SHUTTLE OPTIONS

Table 12 summarizes the shuttle system options presented in this section, with regard to number of vehicles, capacity requirements to meet peak demand, and total daily costs. Possible route alignments are shown in Figures 8A-8C. Detailed description of the options are presented below.

A. KEZAR STADIUM TO MUSIC CONCOURSE SHUTTLE (SMALL SHUTTLE SYSTEM)

Figure 8A shows a possible route for a small shuttle system. It would serve the Music Concourse and connect to park and ride lots at Kezar Stadium and elsewhere. To insure the system is well utilized, the following operations are assumed:

1. Service scheduled for summer season weekends only, when park use is at its greatest.
2. Preferential parking in neighborhoods to the north and south of this portion of the park; and
3. Some restraints on parking and auto use in effect within this eastern portion of the park. An illustration of an auto restraint is a conversion of Bowling Green Drive into a path, with the tail ends of the road available for parking.

The demand for such a system and the required shuttle capacity can be roughly estimated. We know from a 1981 parking survey, that 2,221 spaces are available in the eastern portion of the park (Kennedy Drive, Stow Lake,

TABLE 12

PARK SHUTTLE SYSTEMS: OPERATIONS AND COSTS

SHUTTLE SYSTEM [1]	SYSTEM CAPACITY [2] (PERSONS/HOUR)	TOTAL COST PER DAY [3]	
Kezar-Concourse	400	MUNI:	$1,600
4 buses		PARK:	960
		CHARTER:	864
East End	500	MUNI:	$3,200
8 buses		PARK:	1,920
		CHARTER:	1,728
Parkwide	670	MUNI:	$4,000
10 buses		PARK:	2,400
		CHARTER:	2,160

[1] 20 passenger buses presumed

[2] Minimum capacity required on summer weekends midday to serve demand estimatd from park user survey, May, 1982.

[3] MUNI charter rates @ $50/hr.; Park or Park Association vehicle costs @ $12/hr., labor @ $13/hr., fuel and maintenance @ $3/hr., and insurance @ $2/hr., totalling $30/hr.; charter at $30/hr. less 10% for volume customers, totalling $27/hr. Eight hour day presumed.

South Drive. Music Concourse and others) on Saturday.[1] Of these, midday

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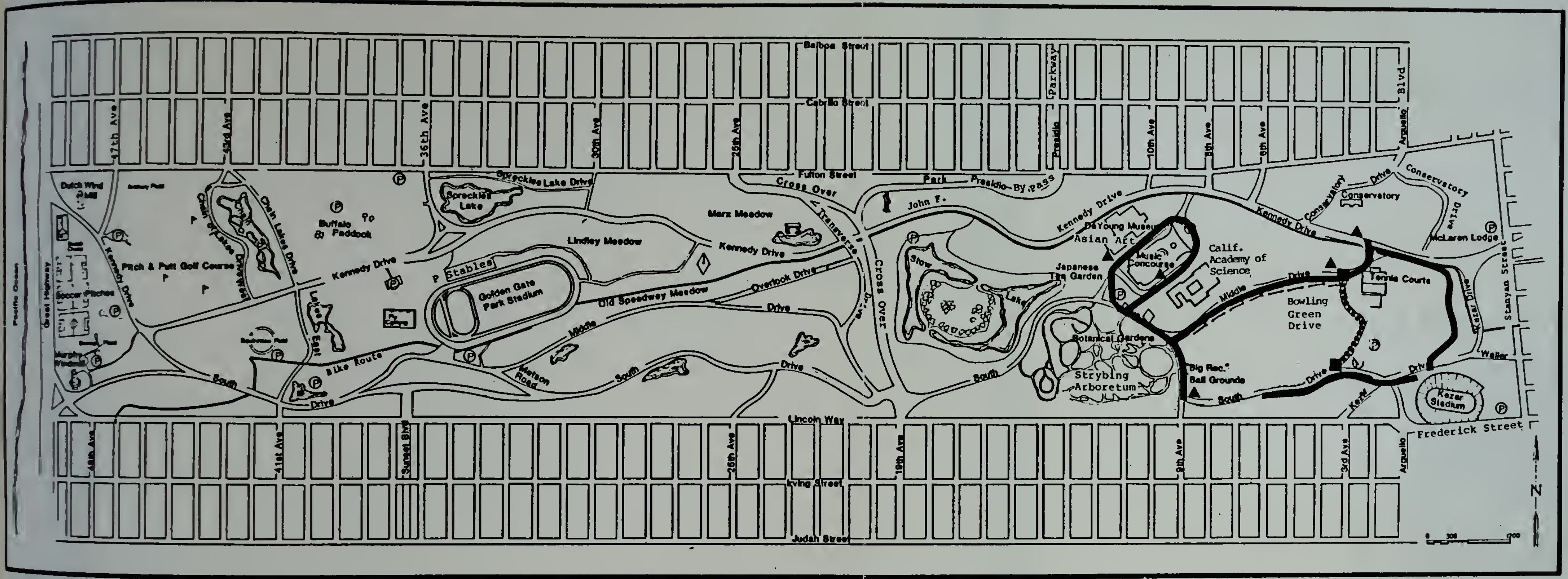
[illegible]
Francisco State University Graduate Level Class, 1981

[3] Golden Gate Park Survey



LEGEND

▬ SHUTTLE ROUTE

▲ SHUTTLE STOPS

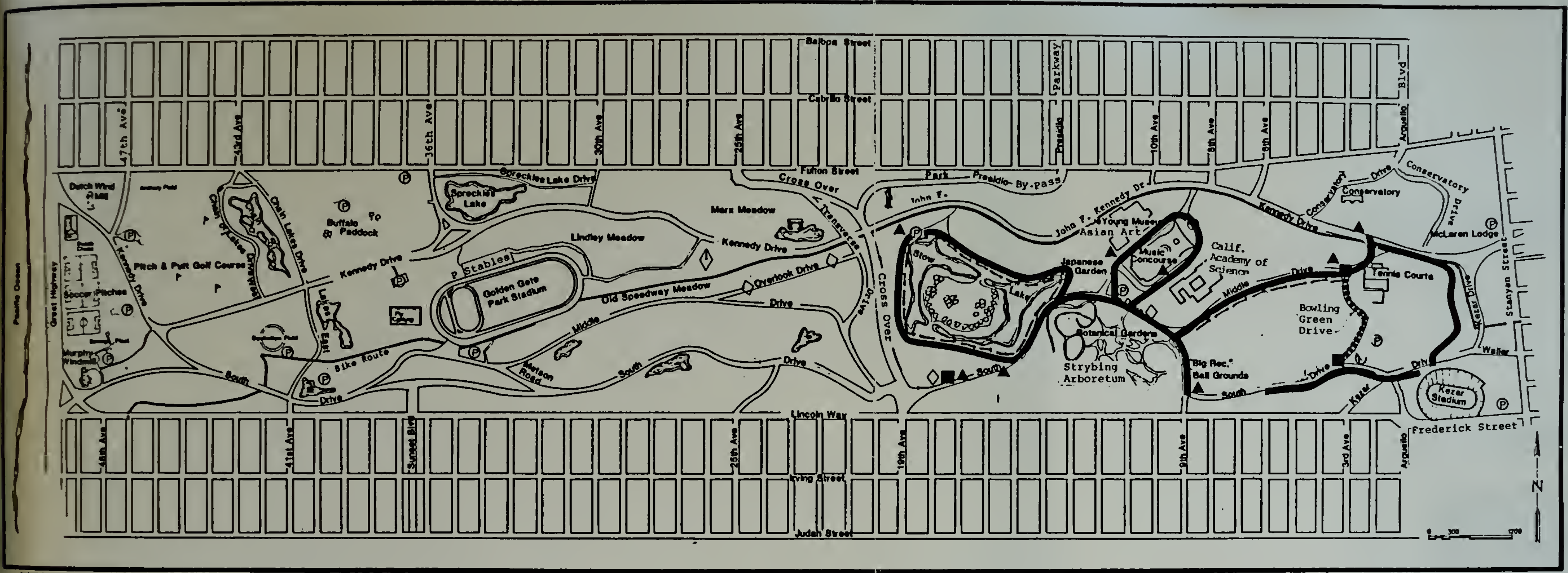
■┅■ PATH WITH PARKING AT ENDS

FIGURE 8A

South Drive. Music Concourse and others) on Saturday.[1] Of these, midday

Golden Gate Park Auto Closure Project, Environmental Impact Report, San Francisco State University Graduate Level Class, 1981

[3] Golden Gate Park Survey



LEGEND

▬ SHUTTLE ROUTE

▲ SHUTTLE STOPS

■┅■ PATH WITH PARKING AT ENDS

◇ ■ CLOSED ROADS WITH PARKING AREA

◇ CLOSED ROAD

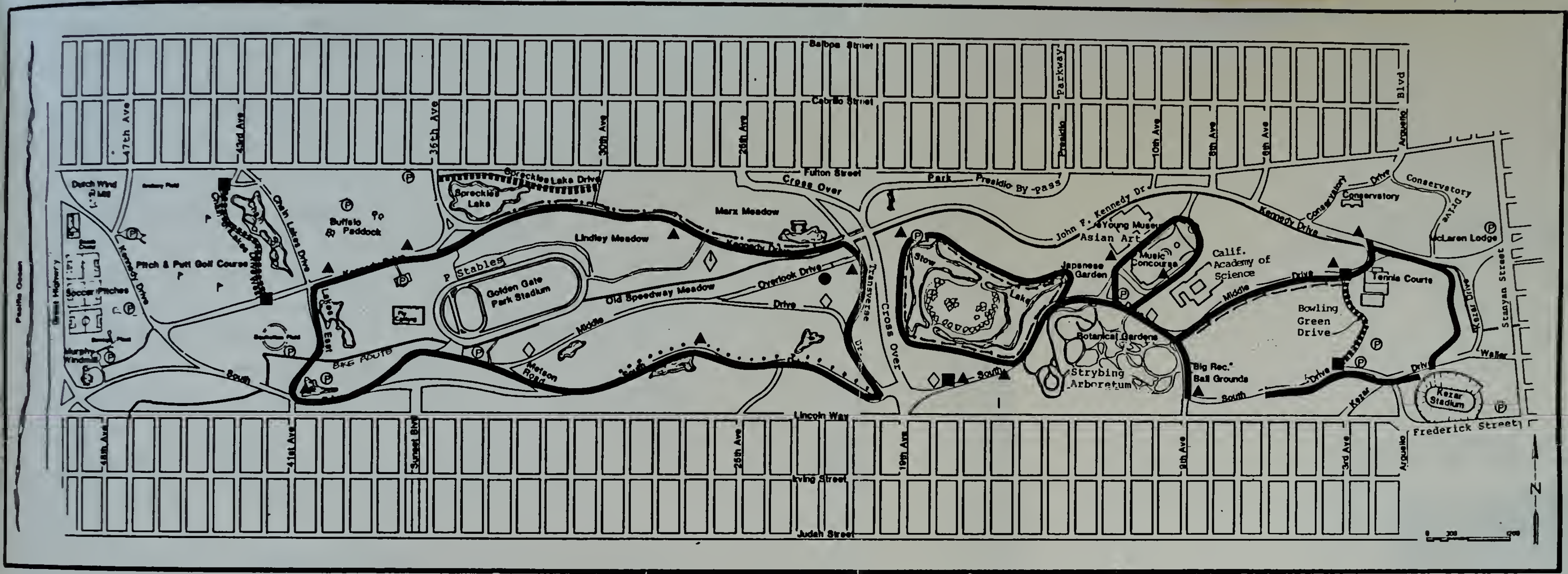
--- NO PARKING

FIGURE 8B

South Drive, Music Concourse and others) on Saturday.[1] Of these, midday

Golden Gate Park Auto Closure Project, Environmental Impact Report, San Francisco State University Graduate Level Class, 1981

[3] Golden Gate Park Survey



LEGEND

▬ SHUTTLE ROUTE

▲ SHUTTLE STOPS

■┅■ PATH WITH PARKING AT ENDS

◇ ■ CLOSED ROADS WITH PARKING AREA

◇ CLOSED ROAD

—— NO PARKING

-·—— PARKING ONE SIDE

······ INSERT PARKING BAYS

● PARK & RIDE LOT

SHUTTLE BUS SYSTEM OPTIONS

FIGURE 8 C

South Drive, Music Concourse and others) on Saturday.[1] Of these, midday demand for one Saturday (9/19/81) was 1,263 (excluding Stow Lake, which is not served under this option). Adjacent to the park on the east end, park visitors use curbside parking on Fulton Street, Lincoln Way and certain neighborhood streets. A graduate student paper obtained from Park files suggests Fulton Street from Arguello Street to 11th Avenue might accommodate 50 - 100 park user vehicles on a typical weekend.[2] The rest of Fulton Street shows a lower frequency of park user vehicles. For Lincoln Way, demand occurs from about Tenth Avenue eastward to Arguello Blvd, suggesting possibly another fifty cars. On the streets leading off Fulton Street and Lincoln Way the Park file study of capacity and turnover suggests about 300 spaces are available for parking.[3] The student survey (comparing early morning to midday use on weekends) suggests about one-half of these 150 vehicles might be used by visitors. In all, visitors to the east park area arriving by auto might park 1,500 vehicles on weekends and during midday. Assuming an occupancy rate of three people per vehicle, typical of recreation trips, 1,500 vehicles bring 4,500 people during midday hours. This is not all day demand, of course, which may be from two to four times this amount depending on turnover.

The demand estimates present several design implications for a shuttle system. A sample of survey results reveals from 15 to 20 percent of respondents would use a frequently operating shuttle under closures or pricing restraints suggested in the survey, although the restraints described in the survey are more drastic than suggested under this option. If ten percent of visitors arriving at the midday peak period demand the shuttle, the system would need to carry about 450 people. Assuming a demand of 15 percent, then 675 people would ride the shuttle. Public parking spaces at Kezar Stadium numbering 250 on weekends might not be adequate to serve peak demand. Thus, extra park and ride space might be developed on Bowling

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[1] Golden Gate Park Survey, 1981,supervised by Deborah Learner, Park Planner

[2] Golden Gate Park Auto Closure Project, Environmental Impact report, San Francisco State University Graduate Level Class, 1981

[3] Golden Gate Park Survey

Green Drive and some users could park and board the shuttle at a designated stop on South Drive.

The number of required buses depends on the number of stops (5 aside from Kezar are suggested), loop distance, (about 2.5 miles), size of bus (20 passengers presumed), bus speed (assume 12 mph), and desired level of service. Since each bus could appear five times per hour given the loop time, each bus provides 100 seats per hour. To maintain a capacity of 400 to 700 passengers per hour, from four to seven buses are needed at peak periods. Of course, if trams or other larger buses are used (e.g. 40 passengers) fewer vehicles and drivers are required.

B. EAST PARK SHUTTLE (MEDIUM SHUTTLE SYSTEM)

A possible route for a medium size shuttle system is also shown in Figure 8B. It serves the Music Concourse from the same park and ride facilities (Kezar Stadium, Bowling Green Drive) as the small system described in Option A, but in addition, serves Stow Lake. For illustration, more auto restraints are added to those in Option A, the Kezar Stadium to Music Concourse system. Included are the closure of South Drive at Crossover and Middle Drive East and restricted parking around Stow Lake. Weekend summer service is assumed.

What might be the peak period demand for this system, and the required capacity? Referring to the 1981 parking survey, the parking demand in the park including Stow Lake is 1,434 spaces. Including park users parked outside the park, approximately 1,700 vehicles carrying 5,100 people are parked during midday.[4] If 10 to 15 percent of peak users demand the shuttle, this results in 500 to 750 potential peak users. Since this loop is 3.5 miles, loop time per bus is close to 20 minutes, and each bus appears three times per hour for a capacity of 60 seats per hour. To provide a service capacity of 500 to 750 passengers per hour, from eight to twelve buses might be needed, assuming 20 passenger capacity for each vehicle. A higher service capacity per hour would require more or larger vehicles.

As with the small shuttle system, the parking spaces at Kezar Stadium might not be adequate for this option and a portion of the South Drive closure might serve as a park and ride area. Undoubtedly, park users would also park along South Drive west of Crossover under this set of auto restraints.

C. PARK WIDE SHUTTLE LARGE (SHUTTLE SYSTEM)

Figure 8C shows an illustrative option for a large parkwide system. In this approach, again a weekend program, shuttles in the East Park option are maintained, but are connected with another system serving the west end of the Park, traveling on South Drive, Chain of Lakes Drive East, Kennedy Drive and Transverse Drive. The kinds of auto restraints which might accompany this system include:

- Restriction of parking on the north side of Kennedy Drive to Spreckels Lake;

- Closure of Middle Drive West;
- Conversion of Chain of Lakes Drive West to a path with parking on each end;
- Restriction of parking on South Drive as far as Middle Drive by way of inset bays for groups of perhaps twenty cars, with a bay separation of 200 to 300 feet.

Because restraints are so substantial, an added park and ride lot might be necessary. One location might be the triangle between Transverse Drive, Overlook Drive and Middle Drive West, where compost is now stored.

Regarding the question of demand and capacity, the 1981 parking survey reveals parking demand of 567 spaces, with a total of 3,169 spaces available in the west end of the Park.[5] Assuming park users of the west end generally do not park on streets around the park, this parking demand may

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[4] Golden Gate Survey, Op. Cit.

[5] Golden Gate Park Survey, Op. Lit.

represent most user demand for the area. Thus, midday weekend demand is about 1,700 people. If ten to fifteen percent peak users demand the shuttle, this represents from 170 to 250 potential peak users. Since this shuttle loop is about three miles, loop time is about fifteen minutes and each bus appears four times per hour for a capacity of eighty seats per hour, two to three buses would be needed. For the complete Park wide service, ten to fifteen vehicles would be required.

COSTS, FINANCING AND INSTITUTIONAL ISSUES

Three broad options of operating the shuttle systems were examined. These are operations by Muni, the Park or Park Association, and private charter or contractor. For each option, costs, financing and certain institutions and political issues are explored.

OPERATIONS BY MUNI

Muni could operate the shuttle options in one of two ways. One is a charter service at $50 per vehicle hour including driver and all vehicle costs.[6] Currently, charter buses are not available during the a.m. and p.m. peak periods from 7:00-9:00 a.m. or 3:30-6:00 p.m. Thus, charter vehicles could begin park service at a reasonable time, but would have to complete service before many park users had left the park. A second option is for Muni to operate the suggested routes as regular route service. The current average cost for vehicles in such service is in the range of $35-37 per vehicle hour.[7] There are advantages and disadvantages to Muni operated service. One disadvantage appears to be that Muni operates only GMC 48 passenger vehicles or AMC General 41 passenger vehicles. While a few such vehicles might be acceptable to park users, the significant number of vehicles needed to serve the options might bring unacceptable environmental impacts. One advantage to using Muni is the position it enjoys in attracting one possible source of State financing -- Transportation Development Account.[8] Interviews with MTC suggest that planning and decision makers are not likely to approve state TDA money provided under Section 4.5 for Community Transportation Service, for any but Muni operated service.[9] MTC planners say there are only rare cases of TDA monies approved by MTC for bus service operated by other than public bus operators in the region. For example, the City of San Jose received TDA Section 4.5 monies for a park and ride system, but only on a demonstration basis. Once proven, operations were transferred to the Santa Clara County Transit District. Likewise, BART has received TDA monies to contract with a charter service for a shuttle at the Glen Park Station; however, the approval for this shuttle system took a very long time and is not a likely approach for future BART shuttles.

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[6] Interviews with Frank Bauer, Barbara Brown, Buford Johnson, MUNI, May, 1982.

[7] Ibid

This is not to suggest that financing is assured for any Muni operated service in the park, as the future of TDA monies is entering a crucial debate in the legislature with uncertain outcome. In addition, TDA monies for San Francisco are currently allocated to elderly and handicapped groups, with which the Recreation and Park Department would have to compete in applying to MTC for TDA funds. Finally, another possible source of operating assistance for public transit operators, Federal Section 5 monies, is slated to end in 1982. Thus, the probability that Muni operated shuttles might attract outside financing is uncertain.

OPERATION BY GOLDEN GATE PARK OR PARK ASSOCIATION

The Park or a park association such as the Friends of Recreation and Parks, could purchase vehicles and operate them with its own or contracted labor. Purchase and operation can be the least costly approach and is the reason hospitals, businesses and universities often operate shuttles. These institutions benefit from inexpensive labor, favorable lease purchase terms, steady use of vehicles and labor, and large existing liability insurance which can be extended to the shuttles. Purchasing vehicles also insures that the desired type of vehicles are obtained and are able to be modified as needed. However, for the three shuttle options suggested here, service is only recommended for peak weekend and summer use. Thus, costs per vehicle-hour are not spread over daily operations throughout the year. Also, because more than a couple of vehicles are recommended, storage and insurance costs might become significant.

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[8] The State of California collects and allocates gas tax monies for transportation.

[9] Interview with Jerome Wiggins, MTC, May,1982

What are the vehicle costs for a range of possible vehicles the Park or a park assocation might consider? Contacts with suppliers or shuttle buses and trams suggest a considerable range. Micro Bus of Southern California supplies vehicles to parks, zoos and recreation facilities.[10] New cable car trams with capacity of 30-35 passengers cost $55,000 to $60,000 each. New so-called Glamor Trams operating at the Los Angelos Arboretum cost $35,000 to $40,000. These are fully enclosed vehicles with large side windows. The Mighty Mite, composed of tug and trailers (open air or enclosed) each holding 22 passengers, costs about $30,000 used and $80,000 new. American Carrier, builder of the Yosemite double deck trams which hold 75 passengers and are pulled by a 1½ ton truck, cost $72,000 for truck and trailer.[11] In short, most any new large shuttle vehicle might cost $50,000 to $75,000, and perhaps $30,000 to $50,000 used. For vehicles in the low range of $30,000, typical 3-5 year lease purchase arrangements result in a cost of about $850/month. If the average speed is 12 mph, and service is eight hours per day, eight days per month, this cost is about $1.00 per mile or $12 per vehicle hour. Figure 9 shows an example of trams, tugs and trailers.

Labor is another major cost to consider. Our interviews with the City Civil Service indicate there is not an inexpensive job classification suited to shuttle bus operations.[12] The transit operator at $10.77/hour

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[10] Interview with Louis Kaminer, Micro Bus Corporation, Los Angeles, May, 1982.

[11] Interview with Ken Reskowski, American Carrier, Fresno, May, 1982.

[12] Interview with Sandra Cole, City Civil Service, May, 1982

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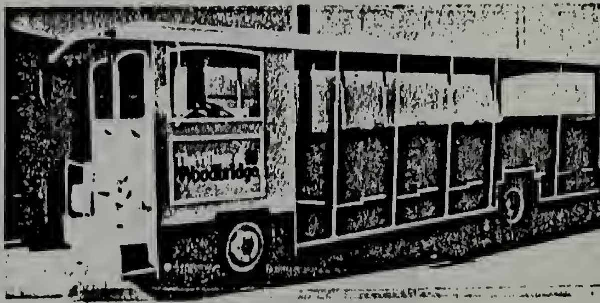

Used Equipment

FIGURE 9

EXAMPLES OF SHUTTLE BUSES AND TRAMS Source: Micro Bus Corporation plus 35% benefits is one suitable class. Light truck operator is another possibility, but labor rates are still on the order of $13/hour. The chauffeur is a possibility, at about $8/hour, but may not be a suitable class. The Park could apply for a new class, e.g. shuttle operator, but Civil Service prefers not to create new classifications. Another option is to contract with charter services exclusively for their labor services. City Proposition J allows for this arrangement, and the controller may approve if the labor can be shown to be less expensive than the City classification. One charter service interviewed said labor, dispatch service, driver insurance, and workman's compensation would be $14.50 per vehicle hour.[13] The least expensive labor arrangement was found at the San Francisco Zoo. The San Francisco Zoological Society operates the Zebra Zephyr with labor hired from Teamsters Local 856. The labor rate is $7.25 per hour.

In sum, for weekend only service, vehicle acquisition costs and labor --excluding insurance, maintenance and fuel -- total nearly $20/vehicle hour, assuming the least expensive labor and vehicles. This is not much less than some of the charter services, which include the costs of fuel, vehicle maintenance, storage and insurance. If fuel and maintenance are 25-30 cents/ mile or close to $3.00 per vehicle hour (the cost UCSF estimates for its 20 passenger shuttles [14]), then costs are even closer to charter rates.

Clearly, the only way for self operated weekend-only service to be cost effective compared to contracting for service, is to rely on inexpensive labor at no more than $7 or $8 per hour. The San Francisco Zoo provides the model. The Zoological Society operates the shuttle without using relatively expensive city labor. Could the Friends of Recreation and Parks operate a shuttle system as the Society operates the Zephyr? Interviews with the Friends of Recreation and Parks suggest they would be reluctant to do so for two reasons.[15] One, the Friends are concerned about possible liability, as evidenced by reluctance to assume liability for sale of goods through a gift shop at Coit Tower. Two, the Friends would want the shuttle to break even or sustain itself through fares. This is highly unlikely. Even the Zoo Society Zephyr priced at $1.50 for adults and 75¢ for children does not cover its costs of operations and depreciation, though revenues from all concession sources (rides, merchandise, food and exhibits) do cover all Society costs.[16]

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[13] Milt Henke, Vista Tours, San Francisco, May, 1982

[14] Interview with Jim Wood, UCSF, San Francisco, May, 1982

One possible source of financing the shuttle system would be parking fees or park entrance tolls. A preliminary review of the park user survey reveals only about seven percent of respondents would pay $3.00 per day to park on controlled or priced streets in east park if a frequent shuttle were available. Many more would park on streets around the park, take Muni, the shuttle, or park on unpriced streets in the park. If about 1,400 vehicles are parked at midday in east park on a Saturday and two times as many throughout the day, the seven percent represents only 200 vehicles. At $3.00 per day, the revenue of $600 only would pay the cost of two shuttles operating eight hours per day at $30 per vehicle hour, assuming service could be operated at this rate. Of course, it is difficult to estimate from survey information the time demand for shuttle service or pay parking. It is quite possible shuttle ridership may be less than estimated by the survey results, and more people might pay parking or toll fees than indicated in the survey.

OPERATION BY CHARTER

Information was gathered on current charter rates for a variety of vehicles. VISTA Tours in San Francisco, operator of the Fogcutter shuttle connecting certain hospitals with BART and Muni in San Francisco, charges $27 per hour for shuttles up to 14 passengers and $30 per hour for shuttles over 14 passengers if operated under 18 miles per hour.[17] For a regular weekend, summer service, the rates are discounted ten percent. Cable Car Charters operates a vehicle looking like a cable car and holding 35 seated, 50 standing.[18] The rate is $85 per hour, but would be less if operated in regular service. Managers would not quote the lower price without a formal bid request. For larger vehicles, Transcal operates 39 and 49 passenger buses for $210 and $235 per eight hour day or $26 per hour and $30 per hour.[19] Charter rates include all costs for vehicles, operations, labor and insurance.

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[15] Interview with Jane Otto, Parker Maddox, Sandy Calio, Friends of Recreation and Parks, May, 1982

[16] Interview with Margaret Burks, San Francisco Zoo, May, 1982.

There are several advantages and disadvantages to charter service. There are a range of vehicles available and for regular service, the vehicles can be painted or modified according to preference. Service can be started, altered and terminated easily. Costs relative to the alternatives are favorable and there is no concern about vehicle storage, maintenance and operating liability. The main disadvantage relates to financing. As mentioned, MTC is not inclined to approve TDA financing for charter service. One exception would be if the service were clearly temporary, intended as a precursor to regular Muni service.

SUMMARY AND CONCLUSION

Three shuttle bus options were developed to illustrate issues of demand, operations, cost, financing, and institutional constraints. Auto restraints accompany each option to illustrate ways shuttle use can be assumed and how much use might occur. Weekend, summer service is suggested to accomodate peak demand. If the auto restraints identified earlier generate demand for the shuttle at the minimum indicated by the park visitor survey, then midday demand will justify the number of 20 passenger vehicles indicated. These vehicles operating on routes shown in the figures will give the capacities ranging from 400 to 670 persons per hour.

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[17] Interview with Vista Tours, Op. Cit.

[18] Interview with Christine Bennett, Cable Car Charter, San Francisco, May, 1982.

[19] Interview with Terisa Ortiz, Transcal, San Francisco, May, 1982.

Costs per day for providing the service range from $800 to $1,600 per day for the small system, Kezar Stadium to Music Concourse, and between $2,000 and $4,000 per day for a large parkwide system.

Cost and financing issues vary for the shuttle systems. Muni charter rates make its service the most expensive, even if operated not as a charter as assumed, but as regular rate service at $35 to $37 per vehicle hour. This rate is more than at least one private charter service and more than what the Park operated service might cost. However, the estimate of Park operated service is very rough and tentative. It is based on lease purchase of the least expensive vehicle found, a city transit operator labor rate, a rough estimate of operating and insurance costs and no allowance for storage costs. Only a more detailed study, particularly relative to labor and insurance, will make the estimate more reliable. If labor costs can be cut, perhaps by a Park Association operating the shuttle or via contract labor, and if storage and insurance costs are minimal, then it is possible the Park could operate the shuttle for less than a private charter service. But generally, the charter option probably will be the least costly option for summer, weekend service. The problems with private charter service are both financial and institutional. One source of possible outside funding, state TDA monies, must be approved by MTC. MTC is not likely to approve unless Muni is the long-term operator. It may be possible to begin shuttle service with TDA monies provided the service is only a test. If successful, the shuttle system would be later operated by Muni. This is the approach the City of San Jose used to begin its park and ride service before the shuttle system operation was assumed by the Santa Clara County Transit District.

Another important finding regarding financing comes from the recent survey of park users. It appears revenues from fees or tolls may not be substantial compared to shuttle costs. Not only are user fees unpopular, but when asked for their response to fees, only about seven percent of users indicated they would pay $3.00 to park on priced streets. Revenues from this number of users would not cover the cost of even the smallest shuttle system regardless of which entity operated it. It should be noted, however, that survey respondents tend to underestimate their willingness to pay parking charges and road tolls, while over-estimating their ridership on shuttle bus sytems. Thus, there is a possibility that fees could support at least a small shuttle bus system.

At this stage of the study, three areas of shuttle bus feasibility require more analysis. One, the Park staff should pursue the possibility of State TDA funding under the assumption that Muni may ultimately operate the shuttle bus system. Not only is this avenue politically and institutionally the easiest alternative, but nothing is lost at this stage in gaining more information. The time necessary to gain approvals for TDA funding is long and the Park staff should know what must be done in case a shuttle system is to be tried. Second, since the Park operating a shuttle service similar to the San Francisco Zoo is potentially cost effective, Park staff and consultants should better specifiy the associated costs of labor, insurance and vehicle storage. Three, auto restraint measures need more investigation. The restraints presented in this section have been illustrative only, and refinement of these and/or development of alternative auto restraints are needed.

VI. DIRECTIONS FOR PHASE II

While options for minimizing traffic problems in the Park will not be thoroughly developed until Phase II, Phase I work has revealed certain promising options and transportation management areas which can be investigated or refined in Phase II. These areas are described below.

TRAFFIC CIRCULATION

Weekend manual traffic movement counts, machine line counts, and Level of Service determinations are needed for key intersections before a final analysis of traffic flow conditions within the Park can be made. These counts should be conducted on both Saturdays and Sundays early in Phase II. Particular emphasis should be devoted to access intersections such as Kennedy Drive at Kezar Drive, Kezar Drive at South Drive, South Drive at Ninth Avenue, Crossover Drive at South Drive, and Kennedy Drive at 8th Avenue and Tea Garden Drive.

The feasibility of a traffic signal at Kezar Drive and Kennedy Drive requires more investigation, both in terms of suitable operation for existing traffic volumes, and coordination with pedestrian crossings of Kennedy Drive.

The feasibility of a grade separation at South Drive and Crossover Drive should be investigated in the long-term. In the short term, restrictions of left turn movements from South Drive during peak weekday and weekend periods should be investigated to alleviate traffic congestion on South Drive.

High priority accident locations identified in Phase I should receive further study to develop appropriate measures which reduce vehicle speed and/or reduce accident potential. Particular emphasis should be placed on low-cost measures that are suitable for the Park environment.

An evaluation of the impacts of closing 8th Avenue at Fulton may be warranted due to opposition to the 6th Avenue closure recorded by Richmond

District residents and some public agencies. The impacts of closing other Park roads such as Chain of Lakes Drive, 30th Avenue at Fulton Street, Metson Road, and Bowling Green Drive should be evaluated. Some of these closures may be temporary, or placed in effect during peak use periods.

PARKING

Measures should be identified which direct or rechannel parking demand to underutilized parking areas such as the Stow Lake area, or areas in the western or southern portion of the Park. These measures might consist of a combination of signage, road closures, and provision of parking information at major activity centers, and the Recreation and Park Department offices. In addition, although the Park-wide direct interview survey indicated that road closures, development of new parking lots and assignment of parking fees may generally not be acceptable to Park users, these measure should be carefully evaluated in conjunction with a shuttle bus system.

PUBLIC TRANSIT

Dialogue between the San Francisco Recreation and Park Department and the San Francisco Municipal Railway should continue with the intent of improving transit service to the Park. Impacts of potential changes to transit service to the Park and recommendations presented in the Muni Five Year Plan need to be assessed. Re-routing of the line 44-O'Shaughnessy from Cabrillo Street to Balboa Street should be considered as a means of reducing adverse impacts of bus operation to residents living along Cabrillo Street.

SHUTTLE BUS SYSTEM FEASIBILITY

Three areas of shuttle bus feasibility require more analysis:

1. Recreation and Park Department staff should pursue the possibility of obtaining State Transportation Development Account (TDA) funding under

the assumption that the S. F. Muni may ultimately operate the shuttle system.

2. Associated costs of labor, insurance and vehicle storage of a Park operated shuttle system should be estimated to greater detail.

3. Realistic auto restraint measures which would enhance the feasibility of a shuttle system should be identified.

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REFERENCE

Golden Gate Park Comprehensive Transportation Study

San Francisco Recreation and Park Department

Draft - Phase 1 Report

Appendices

Jefferson Associates, Inc.
July 1982

Golden Gate Park Comprehensive Transportation Study

San Francisco Recreation and Park Department

Draft - Phase 1 Report

Appendices

Jefferson Associates, Inc.
July 1982

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APPENDIX A

AUTHORS, ORGANIZATIONS AND PERSONS CONSULTED

AUTHORS

Jefferson Associates, Inc.
683 McAllister Street
San Francisco, CA 94102
(415) 931-3001

William S. Ziebron, Project Manager and Planner
Michael Hitchcock, Planner
Joel A. Sabenorio, Planner
David Minkus, Planner and Computer Programmer
Jina Simms, Graphic Artist
Deborah Stevens, Word Processing

Thomas J. Higgins, Public Policy Analyst
885 Rosemount Road
Oakland, CA 94610

ORGANIZATIONS AND PERSONS CONSULTED

FEDERAL AGENCIES
- o U.S. National Park Service

STATE AGENCIES
- o California Department of Transportation
- o University of California, San Francisco

LOCAL AGENCIES
- o Metropolitan Transit Commission (MTC)
  - Jerome Wiggins

- o San Francisco Civil Service Commission
  - Sandra Cole

- o San Francisco Municipal Railway
  - Frank Bauer, Operations
  - Barbara Brown,
  - Buford Johnson, Planning

- o San Francisco Police Department, Traffic
  - Bill Homer, Traffic Analyst
- o San Francisco Recreation and Park Department
  - Deborah Learner, Study Coordinator and Park Planner
- o San Francisco Traffic Engineering Division
  - Gordon Chester, Traffic Engineer
  - Mark Rand, Traffic Engineer
- o San Francisco Zoo
  - Margaret Burks

OTHER ORGANIZATIONS

- o American Carrier
  - Ken Reskowiki
- o Cable Car Charters
  - Christine Bennett
- o Friends of Recreation and Parks
  - Jane Autto
  - Parker Maddox
  - Sandy Colio
- o Microbus Corporation
  - Louis Kaminer
- o VISTA Tours, San Francisco
  - Milt Henke

APPENDIX B

GOLDEN GATE PARK COMPREHENSIVE TRANSPORTATION STUDY

TECHNICAL COMMITTEE

APPENDIX B

GOLDEN GATE PARK COMPREHENSIVE TRANSPORTATION STUDY TECHNICAL COMMITTEE

Mary Burns, Executive Assistant to General Manager, San Francisco Recreation and Park Department

Dave Feltham, San Francisco Department of City Planning

Edith Fried, San Francisco Citizen

Buford Johnson, San Francisco Municipal Railway, Planning Division

Deborah Learner, Study Coordinator and Park Planner, San Francisco Recreation and Park Department

Tom Malloy, General Manager, San Francisco Recreation and Park Department

Mark Rand, Division of Traffic Engineering, San Francisco Department of Public Works

APPENDIX C

OBJECTIVES AND POLICIES

THE PLAN FOR GOLDEN GATE PARK

Objectives
and
Policies

THE PLAN FOR GOLDEN GATE PARK

SAN FRANCISCO RECREATION AND PARK DEPARTMENT
ADOPTED MAY 24, 1979 RESOLUTION NO. 11678

STATEMENT OF PURPOSE: OBJECTIVES AND POLICIES

The Plan for Golden Gate Park

Golden Gate Park is historically the most important and diverse park in San Francisco. Its 1013 acres have provided areas of pastoral retreat and places for active recreation since 1872. Local residents, regional, national, and international visitors have enjoyed and now take pleasure in Golden Gate Park; its excellent reputation is international.

Golden Gate Park is under the jurisdiction of the San Francisco Recreation and Park Commission which is concerned with the future well-being of the park. Plantings and facilities age and after many years no longer serve the purpose for which they were originally intended. Also, conservation and civic organizations as well as individuals want to participate in the retention and enhancement of the investment our community has in the park. The Objectives and Policies of the Plan for Golden Gate Park are intended to establish guidelines for preservation, use and development of the park by a process that includes planning staff, expert advisors and community involvement. The future needs of viable institutions presently within the park must be examined, and, where appropriate, accommodated. Updating landscaping and facilities to keep pace with changes in our society will enable future generations to receive as great a living legacy as we inherited from our forebears.

The original designer of Golden Gate Park, William Hammond Hall, foresaw the park in two different regions. The parkland east of Strawberry Hill includes a variety of intensively cultivated areas and developed facilities while the parkland to the west is a pastoral landscape with open meadows defined by stands of trees and enhanced by lakes.

John McLaren, providing continuity of leadership as the Park's superintendent for fifty-six years, brought the Park's development to fruition. An experienced horticulturalist and forester, McLaren devoted his energies toward the development and protection of an abundant evergreen woodland, establishing the Park's characteristic landscape as we experience it today.

It is expected that the Plan for Golden Gate Park will retain the integrity of the original design yet will have sufficient flexibility to accommodate society's evolving needs.

Statement of Purpose
adopted by the San Francisco
Recreation and Park Commission:
March 16, 1978

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OBJECTIVE I
ACKNOWLEDGE GOLDEN GATE PARK'S CONTRIBUTION TO THE DIVERSITY OF CULTURAL AND RECREATIONAL ACTIVITIES AVAILABLE TO RESIDENTS OF SAN FRANCISCO AND THE BAY REGION: RECOGNIZE THE PARK'S IMPORTANCE AS AN AMERICAN CULTURAL RESOURCE.

The majestic beauty of the Park landscape, its cultural institutions, and its diverse recreational facilities attract a population more dispersed and numerous than that contained within the city itself. The Park provides a dynamic context for a blending of historical, cultural, and social values to meet basic human needs for beauty, tranquility, recreation, and enrichment. These unique qualities must be safeguarded for the well being and enrichment of future generations.

POLICY A
Assure that Golden Gate Park continues to play a dominant role in the overall scenic, cultural, and recreational environment that characterizes the city of San Francisco.

1. The primary function of the Park should be to provide leisure opportunities to all residents and visitors which are appropriate to, and sensitive towards, the Park's unique, century-old horticultural design.

2. The use of the Park should complement and be complemented by activities in other city, regional, and national recreation areas.

3. Golden Gate Park and adjoining areas, including the Golden Gate National Recreation Area, Lake Merced, and Lincoln Park, should be coordinated to achieve continuity of service between each area; development of efficient interpark transport should be a primary concern.

4. Recreational needs of neighborhoods adjacent to Golden Gate Park should be accommodated on neighborhood park sites.

5. Future development or design modifications within Golden Gate Park should not adversely affect the adjacent neighborhoods.

POLICY B
Urge that urban development as it occurs adjacent to Golden Gate Park be consistent with the unique qualities of the Park.

1. As the intensity of development increases it should not visually intrude upon the Park.

2. The Park should be protected from further encroachment by additional roadways.

POLICY C
Recognize that Golden Gate Park, although composed of many distinct parts and features, has, through its evolution and development, achieved completion as a unified entity.

1. All activities, features, and facilities in Golden Gate Park should be subordinate to the present design and character of the Park.

2. Where new recreational or cultural buildings are required for the enhancement of city-wide recreation resources, they should be located outside of Golden Gate Park.

3. No changes or alterations to any Park feature should occur without consideration of the Park wide effects; emphasis should only be given to activities which do not diminish open space.

OBJECTIVE II
PROVIDE FOR THE PROTECTION AND RENEWAL OF THE PARK LANDSCAPE.

"A park...should be an agglomeration of hill and dale, meadow, lawn , wood and coppice presenting a series of sylvan and pastoral views, calculated to banish all thoughts of urban objects, and lead the imagination to picture space beyond as a continued succession of rural scenes and incidents."

William Hammond Hall
November 30, 1873

POLICY A
Ensure that the essential design elements that give the Park its unique landscape character are retained and protected.

1. The major design feature of Golden Gate Park and the framework within which all Park activities occur is its pastoral landscape; the integrity of that basic design must be maintained, and most importantly, remain unaltered.

2. The existing form of wooded areas and their relationship to meadow areas should be maintained; the size, basic texture, and color of Park woods should not be significantly altered nor should the size of meadows be reduced by the introduction of additional trees.

3. It should be recognized that the Park, by design intent, is basically evergreen; large-scale introduction of deciduous or "flowering" trees in areas other than traditional horticultural gardens should be discouraged.

4. Park horticultural gardens and formally landscaped areas provide the contrast and picturesque qualities essential to complete the Park experience; the historic location and traditional horticultural usage of these features should be maintained and protected from encroachment.

5. It should be recognized that, because the Park's unique landscape character is a wholly artificial creation, its care and maintenance is highly labor intensive. Sufficient numbers of qualified personnel must be retained to ensure the Park's continued preservation and maintenance.

6. To ensure the continuity of the Park's essential landscape elements, a position should be established within the Recreation and Park Department in the area of landscape architecture and urban forestry to coordinate and guide landscape plans and horticultural modifications within the Park.

POLICY B

Develop a long-range plan for effective management of the Park's forested areas.

1. A forest management plan for Golden Gate Park should be based on the following objectives:
    a. Develop and maintain on a continuous basis a comprehensive and appropriately detailed inventory of all wooded areas.
    b. Develop and maintain, on a continuous basis, a program to implement long-term reforestation and horticultural maintenance.
    c. Develop appropriate wood-waste recycling and utilization programs.

2. The management plan should complement existing Park reforestation programs by focusing on:
    a. Immediate rehabilitation of the Park's windbreaks.
    b. Removal of hazardous, diseased and dying trees; and replacement with appropriate tree species.
    c. The replacement and maintenance of Park perimeter landscape screening.

3. Additional consideration should be given to aesthetics, wildlife habitat requirements, noise control, and appropriate recreational use.

POLICY C

Develop new irrigation water supplies and improved water distribution and application systems.

1. Provide consistent water pressures and volumes.

2. Improve and maintain existing well system; where feasible, restore inoperative wells.

3. The proposed Southwest Sewage Treatment Plant will generate large quantities of reclaimed waste water. This effluent, with additional treatment, should be used for parkland irrigation. Coordination between the Recreation and Park Department and other affected agencies would facilitate use of reclaimed water to irrigate Golden Gate Park, Lake Merced, Lincoln Park, the Great Highway, and the Golden Gate National Recreation Area.

4. Convert meadow areas, playfields, and where feasible, large scale ornamental plantings to automated irrigation systems.

POLICY D
Establish designated areas of the Park's cultivated landscape as "Naturalistic Parkland" to preserve and protect the pastoral character of the Park and to ensure the retention of Park open space.

1. Areas designated as "Naturalistic Parkland" should include the Park's woodlands, scenic lakes, ponds, marshes, water-courses and wildlife habitats.

2. Recreational use of areas designated as "Naturalistic Parkland" should emphasize and encourage appreciation of the Park's pastoral qualities; appropriate activities would include nature walks, birdwatching, photography and educational pursuits.

3. No structures or additional roadways other than those required for maintenance should be allowed within those areas designated as "Naturalistic Parkland"; where possible, existing roads should be removed.

POLICY E
Ensure that gifts accepted for placement in Golden Gate Park will contribute to the historic character of the Park and are compatible with the planted landscape.

1. Because the Park is essentially a completed landscape, additional features tendered to the Park should be carefully reviewed prior to acceptance to assure that they will not diminish the integrity of the basic design.

2. Creation of an endowment fund to allow prospective donors to contribute to the restoration and maintenance of horticultural features and historic monuments should have a high priority.

3. All gift proposals for Golden Gate Park should be in accordance with existing Recreation and Park Commission "Guidelines for Acceptance of Major Gifts", and the policies of the Plan for Golden Gate Park.

OBJECTIVE III
PRESERVE THE OPEN SPACE OF GOLDEN GATE PARK.

POLICY A
Restrict construction of additional recreational or cultural buildings in Golden Gate Park.

1. It should be recognized that additional structures in the Park would disrupt the balance that presently exists between open space for general park use and special uses requiring buildings.

2. Special use facilities--museums, recreation centers, stadiums, restaurants--can usually be justified as having a park location; however, new facilities should be sited in areas other than Golden Gate Park.

POLICY B
Preserve notable Park landmarks of historic, architectural, and aesthetic value; encourage restoration or reconstruction of other buildings and features that provide continuity with the past.*

1. Criteria for judging historic value and design excellence should be developed and applied to all Park features. Desirable features should be rehabilitated or otherwise restored; questionable features should be removed.

2. Special and immediate effort should be made to identify, organize, and preserve existing plans and plan documents related to the design and construction of all significant Park features.

POLICY C
Assure that modification or replacement of existing Park buildings is compatible with the landscape character and historic form of the Park, and does not diminish existing open space.

1. Where replacement of an existing building in the Park is clearly in the public interest, and is compatible with the Park's landscaped environment, it should not exceed the size of the previous structure.

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* Definitions: preservation, the retention and repair of existing structures or landmarks, example: the Conservatory; restoration, the more extensive work of returning a deteriorated structure or landmark to a useable condition, example: the Sharon building; reconstruction, the erection of a modern copy of a feature that no longer exists, example: Huntington Falls.

2. Structural modifications resulting in expansion of an existing facility, including The California Academy of Science, the Asian Art Museum and the M.H. deYoung Memorial Museum, should only be considered where:

  a. There is a clearly demonstrated need for a defined service to the public that cannot be met by modifications within the existing building.

  b. Sufficient, detailed proof is available that alternative sites outside the Park have been studied, and that the proposed addition can be located only in the area in question.

  c. The effects on the Park of the proposed addition have been fully assessed to ensure that expansion will not necessitate additional surface parking, access roads, or have a deleterious effect on the Park landscape.

  d. Sufficient effort will be expended to assure the very best architectural quality.

  f. Design plans for any proposed addition will include measures that will minimize visual impacts upon the Park environment.

POLICY D
Provide for the phased removal or relocation of structures or facilities which are not essential for cultural or recreational use within the Park, or for Park maintenance.

1. Until the removal of inappropriate Park structures or facilities occurs, they should be maintained only at levels consistent with existing use and safety. No additions or modifications which extend the current functions of the buildings should be permitted.

2. If a non-recreational structure can be successfully converted to a recreational use without incurring additional vehicular traffic, then re-use could be an alternative to removal.

POLICY E
Encourage development of alternative energy sources and recycling systems that would contribute to efficient management and operation of Golden Gate Park.

1. New structures, or substantially remodeled existing structures, should, where feasible, incorporate solar assisted water and space heating systems, and solar assisted cooling systems.

2. All such systems should be sited and designed in a manner compatible with the landscaped character of the Park, and with any building or structure on which such a facility may be erected or installed.

3. Existing recycling of waste materials, including animal wastes, sewage, and horticultural debris, should be intensified in order to resolve environmental and economic problems associated with Park waste disposal.

OBJECTIVE IV
MINIMIZE VEHICULAR TRAFFIC.

Judicious regulation of vehicular traffic in Golden Gate Park and the gradual elimination of the private automobile as the primary mode of internal Park circulation is a desirable goal. Reducing Park automobile traffic, particularly through traffic, will necessitate changes in established driving patterns within the Park and adjoining neighborhoods. A well-financed internal Park transport system should be designed to effectively and pleasantly convey the Park visitor. Gradual, carefully planned and phased implementation, coordinated with the Department of Public Works and other agencies, will minimize vehicular traffic in a manner that will meet the needs of the Park visitor, protect the Park's environment, and reduce impacts on adjacent neighborhoods. Measures taken to minimize vehicular traffic within the Park should be in accord with the objectives of the Comprehensive Plan of the city of San Francisco.

POLICY A
Restrict non-recreational traffic to designated Park roadways in a manner that fully separates business, shopping, and commute traffic from the Park experience.

1. Established traffic patterns and volumes indicate that Crossover Drive and Kezar Drive should be the basic components of a "designated throughway" system. Private vehicular access to the Park proper should not be permitted from designated throughways.

2. Designated throughways should be screened by vegetation to minimize their visual impact.

3. Where Park circulation systems must cross a "designated throughway", grade separations should be provided.

4. Some provision should be made for cross-Park automobile movement in the western half of the Park; it should be a minor roadway in keeping with the Park's "naturalistic" character.

POLICY B
Reduce the number of Park roadways.

1. Roadways that are not required for access to Park facilities, and are not part of the designated throughway system, should be removed and replaced with appropriate landscaping.

2. Access requirements should reflect concern for public safety, Park operations, internal transport, and special needs of handicapped and elderly Park visitors.

POLICY C
Provide for the gradual implementation of a transport system for the Park which would be integrated with public transit and recreational transport systems of the Golden Gate National Recreation Area.

1. The route utilized for any Park transport system should provide access to major facilities, features, and activity areas; existing roadway surfaces should be utilized; and where feasible, narrowed.

2. Special emphasis should be given to achieving optimum service to the Asian Art Museum, the M. H. de Young Memorial Museum, and the California Academy of Science.

3. Internal transport vehicles should be carefully selected to ensure that the system will be energy efficient, provide adequate space for picnic and sports equipment, and most importantly, be easily used by handicapped and elderly Park visitors.

4. The gradual development of a system of visitor parking areas to accommodate a majority of Park visitors should be an integral part of an internal transport system. The major components of this system should be developed at the Kezar site and the Great Highway. Regulatory measures should be taken to assure that these facilities are available for the Park visitor.

5. A parking control program should be developed to discourage all-day commuter parking along Park roadways. Generally, parking meters as a means of control are not compatible with the Park environment and should not be employed.

6. Regulatory measures should be taken to make onstreet parking in neighborhoods adjoining Golden Gate Park available only to those who reside there.

POLICY D
Encourage the use of public transit for recreational travel to Golden Gate Park and adjoining recreation areas.

1. Consideration should be given to developing a comprehensive recreation transport access program for Golden Gate Park and the Golden Gate National Recreation Area, cooperatively planned and developed by both jurisdictions.

2. Public transit improvements should be aimed at increasing city-wide access to Golden Gate Park; service should be frequent and convenient.

3. Foster public transit programs that will encourage the use of Parks, other than Golden Gate Park, that are now underutilized or relatively inaccessible.

POLICY E
Regulate private tour vehicle use of Golden Gate Park by designating in-Park routes and restricting tour vehicle parking to specified areas.

1. Use of Park roadways by tour vehicles should be regulated to ensure a balance between visitor service and protection of the Park's landscaped character.

2. Tour vehicle parking areas should be carefully sited to ensure that their impacts on the Park environment are minimal; additionally, landscaping should be employed to effectively screen these areas.

OBJECTIVE V
FOSTER APPROPRIATE USE OF PARK RECREATION RESOURCES.

POLICY A
Ensure that Park recreational activities are compatible with the Park's environment.

1. Events which attract large numbers of participants or spectators should continue to be regulated under the Recreation and Park Commission Policies for permit and reservation issuance to prevent degradation of the Park's landscape and reduce impacts on adjoining neighborhoods. Large gatherings may well be accommodated in other San Francisco parks, balancing the city-wide recreational program and alleviating wear and tear on Golden Gate Park. Ongoing use of Park meadow areas and athletic fields should be carefully monitored so that measures may be taken to allow adequate turf and landscape recovery time.

2. The Recreation and Park Department should provide regular supervision and recreation for children, especially at the Mary B. Connolly Children's Playground.

3. The presence of wildlife in Golden Gate Park is a valuable recreation resource and should be actively encouraged. Golden Gate Park is a suitable habitat for a great variety of birds and small mammals. Bird species range from the large and conspicuous Red-tailed Hawk to the tiny, secretive Hermit Thrush. Mammals such as squirrels, rabbits, raccoons, and weasels also inhabit the Park. Requirements for retaining a diverse and healthy wildlife are a variety of vegetation, lake and marsh environments, and a Park maintenance and reforestation program that should continue to recognize these needs.

4. Confined animal habitats in Golden Gate Park are not appropriate in "naturalistic" areas. Development of the North American Plains exhibit at the San Francisco Zoo would allow the eventual relocation of a Park Bison exhibit. The fenced Park site presently functioning as a buffalo paddock could be restored to a condition in keeping with the character of adjacent woodlands.

5. At the present time, stable facilities for Park equestrian activities are located in two areas: the Vandervort Barn rental stables west of Middle Lake, and the Golden Gate Equestrian Center adjacent to the Polo Field. All stable facilities should be consolidated at the Polo Field site. Consolidation should be seen as a solution to the health and safety problems associated with the Vandervort Barn area.

6. The Kezar complex, including Kezar Stadium, Kezar Pavilion, parking areas, and playfield, should be redesigned to relate more effectively to general Park use. Redesign and restoration alternatives should incorporate a public parking facility, providing primary service for the activity centers in the eastern half of the Park, including Kezar Pavilion, and linked with the development of an internal transport system. Consideration should be given to the removal of Kezar Stadium or to a reduction in its size.

POLICY B
Improve and maintain Park amenities and ensure adequate visitor services.

1. Restrooms, drinking fountains, trash receptacles, benches, and telephones should be provided at convenient locations throughout the Park; these amenities should be consistent with the intensity of activity of the particular area, and should not detract visually or physically from the environmental character of the Park.

2. Concessions which utilize temporary facilities other than those facilities which are placed in an area on a single event basis should be discouraged because they detract from the visual character of the Park. Concessions which provide service on a long term and continuous basis should be located within an existing building. All vendors should establish effective litter control and an enclosed garbage disposal area.

3. Historic, environmental, educational, and general information about the Park and activities therein should be made available to the resident and visitor through programs, tours, literature and exhibits.

4. The Park is essentially a landscaped garden; outdoor advertisements of future or existing events are a visual intrusion upon its landscaped character and should be strictly regulated. Agencies which desire to give notice of events should confine such activities to public media announcements, the Recreation and Park Department events calendar, or to an area within an existing building.

5. Security systems and police patrols should continue to be employed throughout the Park; additionally, lighting should be installed in areas receiving nighttime use. Park lighting should not detract visually or physically from the character of the Park. Mounted and motorized patrols and other high-visibility security measures should be expanded to protect the Park visitor and Park amenities. Popular use of the Park is the best way to protect it.

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Eugene L. Friend, President
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Keith Eickman
Luisa Ezquerro
Tommy Harris
Frances McAteer
Amy Meyer
Katherine Colzani, Secretary

San Francisco Recreation and Park Department
John J. Spring, General Manager
Thomas W. Malloy, Executive Assistant to the General Manager

Staff, The Plan for Golden Gate Park
Kenneth Bernhardt, Planner/ Project Coordinator
Deborah Learner, Community Liaison/ Assistant Coordinator

Citizen's Advisory Council
Mai Arbegast
Edward C. Bassett
Mary Burns
Mary Connolly
Robert Costello
Henry Degenkolb
Randolph Delahanty
Dorothy Erskine
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The many citizens and community organizations that have contributed to the planning process.

APPENDIX D

TECHNICAL COMMITTEE PRIORITY RANKING OF STUDY OBJECTIVES AND PRIORITIES

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TECHNICAL COMMITTEE PRIORITY RANKING OF STUDY OBJECTIVES AND PRIORITIES

The following is a brief summary of the survey of objectives/policy priorities of Technical Committee members. The number of respondents for each category is attached.

High Priority was assigned to:

- Parking controls - Commute and visitor parking with transit service
- Increased transit service to the park
- Restricting vehicular traffic
- Removal of non-designated throughways not serving park facilities
- Maintenance of access to park facilities for internal transport, safety and the elderly and handicapped

Low Priority was assigned to:

- Screening throughways with vegetation
- Spacious, energy effiecient transit vehicles accessible by the elderly and handicapped
- Transit service to other parks

No consensus was obtained on:

- Provisions of grade separations
- Provision of minor naturalistic roadway in the western half of the park

- Provision of access to major activity areas using narrowed exisitng roadways

- Regulation of parking in residential areas

- Development of transport access program for the Park and G.G.N.R.A.

- Regulation of roadway use to protect the Park's landscaped character

- Siting of tour bus parking areas to minimize environmental impacts

GOLDEN GATE PARK
COMPREHENSIVE TRANSPORTATION STUDY
OBJECTIVES AND PRIORITIES

Objective/Policy	Short Term		Long Term	
	High Priority	Low Priority	High Priority	Low Priori
IV. Minimize vehicular traffic				
A. Restrict Non-recreational traffic	4	-	3	-
1. Restrict private vehicular traffic to designated throughway.	3	1	4	-
2. Screen throughways with vegetation	-	3	-	5
3. Provide grade separation where park circulations systems cross designated throughways.	1	2	2	4
4. Provide minor naturalistic roadway in western half of Park.	(Already There) 5	1	-	1
B. Reduce number of Park roadways.				
1. Remove non designated throughway roadways and roads not serving park facilities.	5	-	3	-
2. Access to address public safety, park operation, internal transport, handicapped and elderly needs.	5	1	4	-
C. Provide integrated transportation system for Park linked to transportation systems of Golden Gate National Recreation Area.	-	3	4	1
1. Park transportation route should access major activity areas and facilities and use narrowed existing road systems	1	3	2	2
2. Provide optimum service to Museums and Academy	3	-	5	-

Objective/Policy	Short Term		Long Term	
	High Priority	Low Priority	High Priority	Low Priority
3. Transit vehicles to be energy efficient, spacious and serve elderly and handicapped.	-	3	1	1
4. Develop visitor parking areas as part of transit system. Major parking areas to be Kezar and Great Highway.	2	1	5	-
5. Develop parking control program to discourage all day commuter parking in Park. Do not use parking meters.	6	-	3	-
6. Regulate parking in adjacent residential areas for resident use only.	1	1	2	2
D. Encourage Use of Transit for Recreational Travel to Park.	1	1	1	-
1. Develop comprehensive recreation transport access program for Park and G.G.N.R.A.	2	1	3	1
2. Improve city-wide transit access to Park.	5	1	3	1
3. Foster transit programs to other parks that are under utilized or inaccessible.	-	2	-	2
E. Regulate private tour bus use of Park	-	1	1	-
1. Regulate use of Park roadways to protect Park's landscaped character.	2	2	1	1
2. Site tour bus parking areas to minimize environmental impacts and screen parking areas.	1	1	3	1

APPENDIX E

SURVEY PROCEDURES

AND INSTRUMENTS

Assemble: 9am- morning shift
12 noon-afternoon shift

bring a clipboard if you have one, wear a watch

zones 1-4 : McLaren Lodge
zones 5-10: Spreckel's Lake

Jefferson Associates, Inc.
April, 1982

April 25th is the first day of daylight savings

GOLDEN GATE PARK TRANSPORTATION STUDY

DATA COLLECTION MANUAL

The San Francisco Recreation and Park Department and Jefferson Associates, Inc. are pleased to have you as part of our data collection team. This study is designed to help improve traffic and parking conditions in the Park. The objective of the surveys that you will help us conduct is to gather accurate information on the travel patterns and attitudes of people who visit or use the Park. The types of information that we will collect include:

- user activities and destinations in the Park
- trip origin
- form of transportation used
- entrance point and time of arrival to the Park; and
- parking locations and user perceptions of parking problems

Additional questions will be asked to obtain information on other aspects of park use. Overall, there will be four survey efforts:

- Park User Survey
- Park User Windshield Survey
- Traffic Survey
- Commuter Parking Windshield Survey

The above surveys will be conducted on two weekends, April 25th (Sunday) and May 8th (Saturday). Weekday surveying will occur on May 5th (Wednesday).

SURVEY PROCEDURES

Survey procedures will vary depending on which survey you participate in. The Park User Survey will involve approaching park users for interviews at designated activity centers such as the Academy of Sciences. The Park User and Commuter Parking Windshield Surveys merely involve the placement of survey cards on the windshields of parked vehicles. The Traffic Survey will involve the pullover of vehicles out of the flow of traffic into a designated survey point for direct interviews. The San Francisco Mounted Police will assist in the pullover of vehicles in this survey. Basic procedures and guidelines for each survey are briefly described below.

PARK USER SURVEY

The Park User Survey involves a high degree of personal contact with park users at major activity centers. Please arrive at your survey area at least fifteen minutes before your shift begins.

Conduct the survey by "roaming" through entrance/exit areas of facilities with high pedestrian traffic. Survey people at regular intervals, such as every 20th person which passes in your field of view. In areas such as meadows or sport fields, roam through the area and contact individuals in different groups. It is important to survey a variety of age groups and socio-economic characteristics. The rate of selection will vary with each activity center and will be designated prior to the days the surveys will be conducted. Each surveyor should bring a clipboard, if possible. If you don't have a clipboard, call Deborah Learner (at 558-3182) and efforts will be made to provide you with one. A badge with your name and some pencils will be issued to you. The badge is to be worn at all times while you conduct the survey. Also, a permit letter will be issued to surveyors who will be conducting interviews where such a permit might be required.

Conduct the survey by approaching the individual in a courteous fashion. Identify yourself and the study, and ask for a few minutes of their time to answer some questions about their trip to the Park. It is essential that you establish eye contact and appear as pleasant and unthreatening as possible. How you accomplish this is, of course, up to you. But above all, please be courteous. If you are refused, survey the next available person. Interview the person in a "question and answer" fashion. Forms will be available in English, Spanish and Chinese. If an individual desires to complete the survey by himself, allow him to do so, but quickly review the form for completeness or obviously erroneous information. For example, a trip origin involving a flight from Tokyo, or a baby factory in Mars does not constitute good data. In such a case, attempt to re-do the survey. Upon completion of the survey form, offer the participant a map of the Park for their future visits.

Try and adhere to the designated selection rate for interviews. Attempt to complete as many surveys as possible. If you find you have trouble obtaining interviews inform the field supervisor. Field supervisors will be checking each survey area to answer questions or help with problems that you encounter. Upon completion of your shift, return to the assembly area to check out and turn in your survey forms.

TRAFFIC SURVEY

The Traffic Survey will involve the help of the Mounted Police in pulling over vehicles at designated survey points. Signs identifying the purpose of the pullover will be erected at each survey point. Conduct the survey in an interview fashion with the driver of each vehicle. As in the Park User Survey, if the driver insists on filling out the form, allow him to do so, but please review the survey form for completeness. After the survey, thank the driver and if needed, enlist the aid of the policeman for directing the vehicle into the flow of traffic.

WINDSHIELD SURVEYS

The Windshield Surveys involve placement of mail-back survey cards on the windshields of parked vehicles. You will be assigned specific roadways to cover. Meeting points will be established prior to the days of the survey. Please check with Deborah Learner for meeting points within the survey area that you have signed up for.

ROUTINE QUESTIONS AND ANSWERS FOR SURVEYS

The following are typical questions and answers that are likely to arise among field surveyors:

HOW DO I GET TO MY SHIFT LOCATION?

You are responsible at all times for arranging your transportation to and from the Park.

WHAT DO I DO IF I AM CONFUSED ABOUT MY SURVEY ASSIGNMENT?

You are responsible for reviewing your assignment at the beginning of your shift. If you have any questions, call Deborah Learner at 558-3182 or Joel Sabenorio at 931-3001. If questions arise in the field, look for Joel, Deborah or another surveyor.

WHAT DO I SAY IF SOMEONE ASKS ME WHAT I AM DOING?

Explain to them that you are working on a Transportation Survey for the City Recreation and Park Department. The survey is needed to help determine travel patterns to and from, and within Golden gate Park. If anyone continues to question you or bother you after a short explanation, ask that they call Deborah Learner or Joel Sabenorio for more information.

WHAT IF I GET SICK BEFORE OR DURING MY SHIFT?

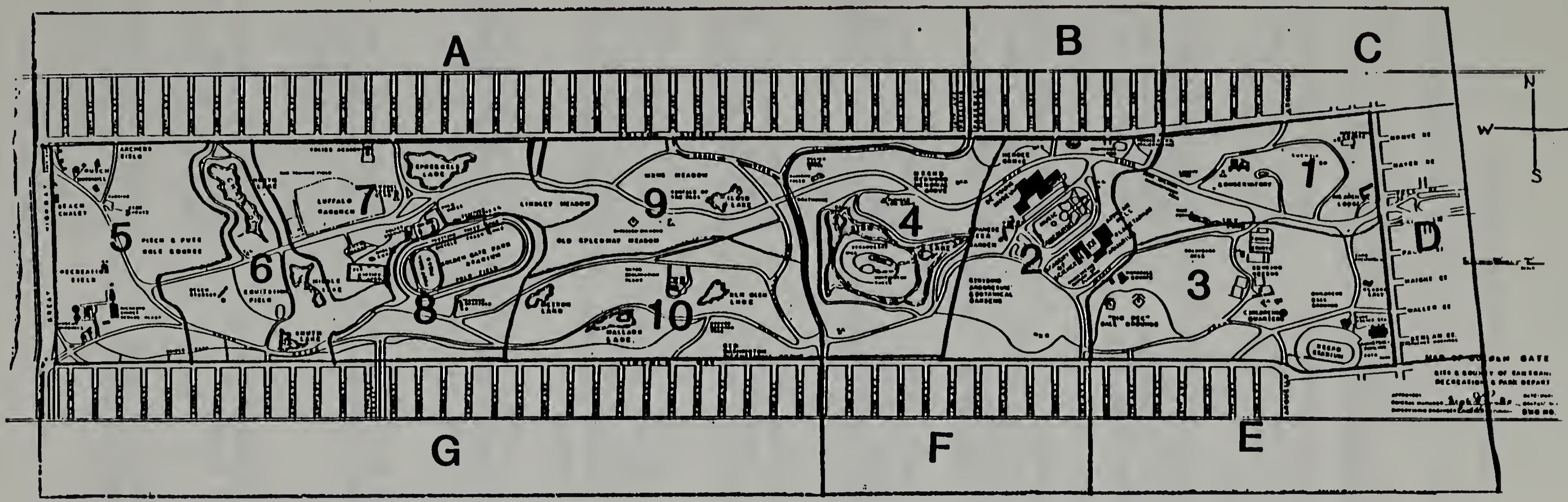
Inform the Field Supervisor as soon as possible. It is important to complete your full shift if possible.

WHAT IF IT RAINS DURING MY SHIFT?

Try to find cover. If it is not possible for any reason, inform your Field Supervisor. If it continues to rain and surveying is no longer possible, return to the assembly point to check out and turn in the survey forms.

FIGURE 1

ORIGIN DESTINATION SURVEY ZONES



ORIGIN/DESTINATION SURVEY

Zone Description: Activity Areas and Boundaries

Zone:	Activity Areas Include:	Limited by these Boundaries:
1.	Conservatory and Conservatory Valley, Kennedy Drive from McLaren Lodge to 6th Avenue, Rhododendron Dell	East of 6th Avenue, North of Middle Drive, Stanyan/ Fulton Streets
2.	Music Concourse, DeYoung Museum, Academy of Sciences, Entrances to Arboretum, Tea Garden	Fulton, Lincoln, Sixth Avenue, Rhododendron Dell, South Drive, 12th Avenue, Arboretum
3.	Children's Playground Tennis Courts, Bowling Green, Delaveaga Dell, Big Rec, Sharon Meadow, Kezar Area	Middle Drive, Western edge of Big Rec, Lincoln Way, Frederick, Stanyan
4.	Stow Lake, Strawberry Hill, Rose Garden, Kennedy Drive, west of 12th Ave., South Drive, 19th Avenue, entrance east	Crossover Drive, Park Presideo bypass, East of Rose Garden, Sunken Meadow, Arboretum
5.	Windmill, Golf Course Lot and club house, Soccer field	Fulton, Lincoln, Great Highway, Chain of Lakes, west 44th Avenue
6.	Chain of Lakes, Bercut Field, Little Speedway Meadow, Kennedy Drive from 40th Avenue to 44th Avenue, South Drive from 44th Avenue to 39th Avenue	Fulton St., Lincoln Way, West of Chain of Lakes Drive, West; East of Chain of Lakes Drive, East
7.	Spreckel's Lake, Buffalo Paddock, Angler's Lodge, Equestrian Center, Kennedy Drive, Lindley Meadow	Fulton St., East of Spreckles, west of Buffalo Paddock, South of Angler's Pools
8.	Polo Fields, Dog Walking Area, Middle Drive, South Drive	Lincoln Way, West of Metson Lake, intersection of South Drive and Middle Drive, north edge of Polo Field
9.	Marx Meadow, Speedway Meadow, Lloyd Lake, 19th Avenue entrance, west	Fulton St., west of 30th Avenue, Lindley Meadow, Speedway Meadow - south of the bike path
10.	Elk Glen Lake, Mallard Lake Hoover Meadow, Metson Lake	Lincoln Way, Crossover Drive, North of Middle and Overlook Drive, West of Metson Lake, intersection of South Drive and Metson Road

ORIGIN/DESTINATION SURVEY
Residential Parking: Zone Boundaries

A. From Great Highway to Park Presidio, Fulton Street and North

B. Park Presidio to Sixth Avenue, Fulton Street and North

C. Sixth Avenue and east, Fulton Street and North

D. Stanyan East, Frederick Street on the South, Fulton Street on the North

E. East of Eighth Avenue, Lincoln Way and Frederick Street on the North

F. 19th Avenue to 9th Avenue, Lincoln Way on the North

G. 19th Avenue to the Great Highway; Lincoln Way on the North

SURVEY DEMOGRAPHICS

Dear Survey Volunteer:

To help monitor the collection of a proper sample, attach this form to your clipboard and please fill out the demographic information after you have filled out each questionnaire. Fill it out on your own, writing in the survey number and checking the boxes for gender, age and ethnic background. Give your best estimate for age and ethnic background. Do not ask the park user for this information.

KEY

Gender: M = Male; F = Female
Age: CT = Children and Teenagers; A= Adult; S = Senior (65+)
Ethnic Background: A = Asian; B = Black; SA = Spanish-American; W = White; O = Other

Survey Number	Gender	Age	Ethnic Background
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
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	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]
	[M] [F]	[CT] [A] [S]	[A] [B] [SA] [W] [O]

City and County of San Francisco **Recreation and Park Department**

April 15, 1982

TO WHOM IT MAY CONCERN:

The bearer of this letter has permission from the San Francisco Recreation and Park Department to conduct a survey related to the Golden Gate Park Transportation Study.

This individual is a volunteer who is entitled to gather information in the Music Concourse of Golden Gate Park on Sunday, April 25, 1982, from 9:00 a.m. to 4:00 p.m. and on Saturday, May 8, 1982 from 9:00 a.m. to 4:00 p.m.

Your courtesy to this volunteer is appreciated.

Very truly yours,

Leonard Fitzpatrick
Assistant Superintendent
of Recreation

Bernice Rodgers

Bernice Rodgers
Assistant Recreation Supervisor

LF:BR:sp

cc: L. Fitzpatrick
Park Division
Recreation Division
Capt. R. Seghy

cLaren Lodge, Golden Gate Park San Francisco 94117

SAMPLING INSTRUCTIONS

ZONE 1

SURVEY STATIONS

1.	Stationary (entrance to Conservatory)	1 hour
2.	Roam (trails and roads in Zone 1)	½ hour
3.	Stationary (entrance to Conservatory)	1 hour
4.	Roam (trails and roads in Zone 1)	½ hour

SAMPLING PROCEDURE

Stationary: Approach the third person and then every third person entering the Conservatory after each form is completed.

Roam: Approach every third person or group of people after each form is completed. Make an effort to approach people of varied ages and both sexes.

Upon completion of shift, return to assembly point at McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
- Zone map and description sheet - place on clipboard
- Demographic sheet - place on clipboard
- Resident zone description sheet.
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

For further information about the Golden Gate Park Transportation Study, interested persons may contact the Recreation and Park Department, Deborah Learner, Study Coordinator at 558-3182 or 558-3706.

A

SAMPLING INSTRUCTIONS

ZONE 2

SURVEY STATIONS

1.	Stationary (entrance to De Young Museum)	1½ hours
2.	Stationary (entrance to the Academy of Sciences)	1½ hours

SAMPLING PROCEDURES

Approach the fifth person and then every fifth person after each form is completed.

Upon completion of shift, return to assembly point at McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
- Zone map and description sheet - place on clipboard
- Demographic sheet - place on clipboard
- Resident zone description sheet
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTION

ZONE 2

SURVEY STATIONS

1.	Stationary (entrance to Academy of Sciences)	1½ hours
2.	Stationary (entrance to De Young Museum)	1½ hours

SAMPLING PROCEDURES

Approach the fifth person and then every fifth person after each form is completed.

Upon completion of shift, return to assembly point at McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
- Zone map and description sheet - place on clipboard
- Demographic sheet - place on clipboard
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone
- Residential Zone description sheet

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C

SAMPLING INSTRUCTIONS

ZONE 2

SURVEY STATIONS

1.	Roam Music Concourse	½ hour
2.	Roam Kennedy Drive	½ hour
3.	Stationary (entrance to Japanese Tea Garden)	1 hour
4.	Roam Music Concourse	½ hour

SAMPLING PROCEDURES

1. Roam: Approach every fourth person or group after each form is completed.

2. Stationary: Approach every third person after completeion of each form.

Upon completion of shift, return to assembly point at McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
- Zone map and description sheet - place on clipboard
- Demographic sheet - place on clipboard ° Resident Zone description sheet
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 3

SURVEY STATIONS

1. Roam between Children's Playground, bowling green and tennis court area. 1 hour

2. Roam along trail, "Big Rec" ballground area and back to Children's Playground, staying between Middle Drive and South Drive. 1 hour

3. Roam between Children's Playground, bowling green and tennis court area. 1 hour

SAMPLING PROCEDURE

Approach every fourth person or group after each form is completed. If a young child is the fourth person and is accompanied by an adult, survey the adult.

Upon completion of shift, return to McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
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- Demographic sheet - place on clipboard
- Residential zone description sheet
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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A

SAMPLING INSTRUCTIONS

ZONE 4

SURVEY STATIONS

1.	Roam on road around Stow Lake	1 hour
2.	Roam on north side of Kennedy Drive through the Rose Garden area and back on the south side of Kennedy Drive.	1 hour
3.	Roam on the road around Stow Lake and around Strawberry Hill.	1 hour

SAMPLING PROCEDURES

Approach every fifth person or group of people after each form is completed. Make an effort to approach people of varied ages and both sexes.

Upon completion of shift, return to the assembly point at McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
- Zone map and description sheet - place on clipboard
- Demographic sheet - place on clipboard
- Residential Zone description sheet
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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B

SAMPLING INSTRUCTIONS

ZONE 4

SURVEY STATIONS

1.	Roam on Kennedy Drive and meadow areas to the north and south of the road inclucing the Rose Garden.	1 hour
2.	Roam on road around Stow Lake.	1 hour
3.	Roam on Kennedy Drive and meadow areas to the north and south of the road.	1 hour

SAMPLING PROCEDURES

Approach every fifth person or group of people after each form is completed. Make an effort to approach people of varied ages and both sexes.

Upon completion of shift, return to the assembly point at McLaren Lodge.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

- Sampling instructions sheet
- Zone map and description sheet - place on clipboard
- Demographic sheet - place on clipboard
- Residential zone description sheet
- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 5

SURVEY STATIONS

1.	Golf course lot	½ hour
2.	Soccer field	1 hour
3.	Windmill	½ hour
4.	Clubhouse area	½ hour
5.	Soccer field	½ hour

SAMPLING PROCEDURE

Survey every fifth person or group of people while roaming within and between the golf course lot, soccer field, windmill and clubhouse. Make an effort to approach people of varied ages and both sexes.

Upon completion of shift, return to assembly point at Spreckles Lake.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

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- Identification card
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- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 6

SURVEY STATIONS

1.	North Lake area	1 hour
2.	Bercut Field (Equestrian area)	½ hour
3.	Middle Lake and Little Speedway Meadow	1 hour
4.	South Lake	½ hour

SAMPLING PROCEDURES

While roaming within and between the survey stations, approach every third person or group that you encounter. Make an effort to approach people of both sexes and varied ages.

Upon completion of shift, assemble at Spreckles Lake.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

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- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 7

SURVEY STATIONS

1.	Spreckles Lake	1 hour
2.	Buffalo Paddock	½ hour
3.	Angler's Lodge	½ hour
4.	Equestrian Center	½ hour
5.	Spreckles Lake	½ hour

SAMPLING PROCEDURE

Approach every third person or group of people while roaming within and between the above survey stations. Make an effort to approach individuals of both sexes and varied ages.

Upon completion of shift, assemble at Spreckles Lake.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
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- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 8

SURVEY STATIONS

1. Golden Gate Park Stadium area (Polo Field).
2. Dog walking area

SAMPLING PROCEDURES

Approach every fifth person or group of people while roaming within and about the above survey stations. Make an effort to approach people of both sexes and of varied ages. Try not to interrupt people actively engaged in an athletic activity (eg. running, bicycling, etc.)

Upon completion of shift return to assembly point at Spreckles Lake.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
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- Surveys are one page, remember to fill in the flip sides.

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- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 9

SURVEY STATION

1.	Speedway Meadow	3/4 hour
2.	Marx Meadow	3/4 hour
3.	Lloyd Lake	3/4 hour
4.	Speedway Meadow	3/4 hour

SAMPLING PROCEDURES

Approach every fourth person or group of people while roaming within and between the above survey stations. Make an effort to approach people of both sexes and varied ages.

Upon completion of shift, assemble at Spreckles Lake.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

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- Residential zone description sheet
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- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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SAMPLING INSTRUCTIONS

ZONE 10

SURVEY STATIONS

1. Metson Lake
2. Mallard Lake
3. Elk Glen Lake

SAMPLING PROCEDURE

Approach every third person or group of people while roaming within and between the above areas. Make an effort to approach people of both sexes and varied ages.

Upon completion of shift, assemble at Spreckles Lake.

THINGS TO REMEMBER

- Read and follow the Sampling instructions for your zone; try to reach all the survey stations.
- Be objective, don't try to convince or debate issues. Help the respondent move through the survey.
- Remember to approach a variety of ages and both sexes.
- Keep a survey volunteer in sight if possible, but don't work as a tight pair.
- Ask question #6 (locations with parking problems) to everyone, whether they have driven to the park or not.
- Return all materials to your assembly area, the surveys as well as clipboards, green sash, etc. which will be used on other field days.
- Remember to fill in the demographic information after each survey.
- Surveys are one page, remember to fill in the flip sides.

SURVEY PACKET CHECK LIST

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- Identification card
- Green sash
- 3 pencils
- 25 English survey forms
- 5-20 Spanish language survey forms (depends upon zone)
- 5 Chinese language survey forms
- Permit letter, if needed in your zone

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APPENDIX E (CONT.):

SURVEY INSTRUMENTS

City and County of San Francisco **Recreation and Park Department**

Time: ____
Zone: ____
Number: A
666

PARK VISITOR TRANSPORTATION SURVEY

Please help us to determine travel patterns and transportation needs to and within Golden Gate Park by answering the following questions. This questionnaire is completely anonymous. Pencils are available if needed. Please return this form to the surveyor.

1a. What are you doing and what places are you visiting in the Park today? (Check as many as appropriate)

Activities

- ☐ Running/Jogging
- ☐ Walking/Sight-seeing
- ☐ Bicyling
- ☐ Picnicing
- ☐ Nature Study
- ☐ Roller Skating
- ☐ Sports (specify) ____
- ☐ Other ____

Places

- ☐ Museum
- ☐ Academy of Sciences
- ☐ Conservatory
- ☐ Tea Garden
- ☐ Arboretum
- ☐ Woods
- ☐ Trails
- ☐ Meadows

☐ Other (specify) ____

1b. How often do you visit the Park per month.

☐ Less than 1/month ☐ 1-4 ☐ 5-10 ☐ 10+

2. What form of transportation did you use to get to the Park today?

- ☐ Walk
- ☐ Bicycle
- ☐ Car
- ☐ Cab
- ☐ Public Transit ☐ Fast Pass
- ☐ Charter or Tour Bus
- ☐ Other (specify) ____

a. Where did you come from today? San Francisco Resident? ☐ Yes ☐ No

City ____ Street/Cross Street ____ Zip Code ____

b. How many people traveled with you? ____

c. If you arrived by Muni Transit, which line(s) did you take?

Line(s) ____ Number(s) ____ Drop off point ____ (map zone)

d. If you arrived by car, where did you park? Refer to map zone ____

3. On which street or path did you enter the park? Refer to map zone ____

4. a. What time of day did you arrive in the Park? ____

b. What time do you plan to leave the park today? ____

5. What will be your general destination when you leave the Park today?

City ____ Street/Cross Street ____ Zip Code ____

6. Are there any areas in or adjacent to the Park where you feel parking is a problem?

Yes ____ No ____ Don't Know ____

a. If yes, where? Refer to map zone ____

b. At the location with the most severe problem, indicate the primary parking problems. Check no more than two brackets.

- ☐ Hard to find a space.
- ☐ Contributes to congestion.
- ☐ Noisy.
- ☐ Is unsightly.
- ☐ Contributes to accidents/ Difficult to cross road.
- ☐ Damages Park grounds.
- ☐ Other (specify) ____

McLaren Lodge, Golden Gate Park

Please check your response to the following statements.

7. If more off-street parking lots were available in the Park and more streets were closed to parking, my enjoyment of the scenic beauty of the Park and safety would increase.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

8. If a convenient and inexpensive shuttle bus were available providing service from parking lots in the Park to park attractions, I would be willing to use the service.

☐ Never ☐ Rarely ☐ Occasionally ☐ Often ☐ Always ☐ Don't Know

9. Kennedy Drive, which is currently closed to vehicle traffic on Sunday should be closed on Saturday also.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

10. If public transit were available that provided convenient service from an area near your home to the Museum and Academy of Sciences, how often would you use it when you visit these facilities?

☐ Never ☐ Rarely ☐ Occasionally ☐ Often ☐ Always ☐ Don't Know

11. Some selected roads should be closed to car traffic and opened up to bicycling, jogging, walking and roller skating.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

City and County of San Francisco Recreation and Park Department

Time: ____________
Zone: ____________
Number: B
526

PARK VISITOR TRANSPORTATION SURVEY

Please help us to determine travel patterns and transportation needs to and within Golden Gate Park by answering the following questions. This questionnaire is completely anonymous. Pencils are available if needed. Please return this form to the surveyor.

1a. What are you doing and what places are you visiting in the Park today? (Check as many as appropriate)

Activities

☐ Running/Jogging
☐ Walking/Sight-seeing
☐ Bicyling
☐ Picnicing
☐ Nature Study
☐ Roller Skating
☐ Sports (specify) ____________
☐ Other ____________

Places

☐ Museum
☐ Academy of Sciences
☐ Conservatory
☐ Tea Garden
☐ Arboretum
☐ Woods
☐ Trails
☐ Meadows

☐ Other (specify)
____
____
____

1b. How often do you visit the Park per month.

☐ Less than 1/month ☐ 1-4 ☐ 5-10 ☐ 10+

2. What form of transportation did you use to get to the Park today?

☐ Walk
☐ Bicycle
☐ Car
☐ Cab
☐ Public Transit ☐ Fast Pass
☐ Charter or Tour Bus
☐ Other (specify) ____________

a. Where did you come from today? San Francisco Resident? ☐ Yes ☐ No

____
City Street/Cross Street Zip Code

b. How many people traveled with you? ____________

c. If you arrived by Muni Transit, which line(s) did you take?

____
Line(s) Number(s) Drop off point (map zone)

d. If you arrived by car, where did you park? Refer to map zone ____________

3. On which street or path did you enter the park? Refer to map zone ____________

4. a. What time of day did you arrive in the Park? ____________

b. What time do you plan to leave the park today? ____________

5. What will be your general destination when you leave the Park today?

____
City Street/Cross Street Zip Code

6. Are there any areas in or adjacent to the Park where you feel parking is a problem?

Yes _____ No _____ Don't Know _____

a. If yes, where? Refer to map zone ____________

b. At the location with the most severe problem, indicate the primary parking problems. Check no more than two brackets.

☐ Hard to find a space.
☐ Contributes to congestion.
☐ Noisy.
☐ Is unsightly.
☐ Contributes to accidents/ Difficult to cross road.
☐ Damages Park grounds.
☐ Other (specify) ____________

cLaren Lodge, Golden Gate Park San Francisco 94117

7. If you believe parking on streets in the park ought to be reduced, give your opinion about the following ways to do so. (You may check more than one.)

a. Develop new car lots in the park. ☐ Agree ☐ Neutral ☐ Disagree

b. Direct visitors to park lots not now used. ☐ Agree ☐ Neutral ☐ Disagree

c. Ban parking on selected park streets. ☐ Agree ☐ Neutral ☐ Disagree

d. Close selected park streets, convert to parking. ☐ Agree ☐ Neutral ☐ Disagree

e. Charge a fee for parking on selected park streets. ☐ Agree ☐ Neutral ☐ Disagree

f. Operate a shuttle bus from central parking lots in the park to park attractions. ☐ Agree ☐ Neutral ☐ Disagree

8. If you believe traffic in the park ought to be reduced, give your opinion about the following ways to do so. (You may check more than one.)

a. Close or narrow selected park streets. ☐ Agree ☐ Neutral ☐ Disagree

b. Charge a toll for entry to selected park areas. ☐ Agree ☐ Neutral ☐ Disagree

c. Operate shuttles from Kezar and Great Highway to attractions. ☐ Agree ☐ Neutral ☐ Disagree

d. Combination of a or b and c ☐ Agree ☐ Neutral ☐ Disagree

e. Improve public transit to the park. ☐ Agree ☐ Neutral ☐ Disagree

City and County of San Francisco Recreation and Park Department

Time: ____
Zone: ____
Number: C 666

PARK VISITOR TRANSPORTATION SURVEY

Please help us to determine travel patterns and transportation needs to and within Golden Gate Park by answering the following questions. This questionnaire is completely anonymous. Pencils are available if needed. Please return this form to the surveyor.

1a. What are you doing and what places are you visiting in the Park today? (Check as many as appropriate)

Activities

☐ Running/Jogging
☐ Walking/Sight-seeing
☐ Bicyling
☐ Picnicing
☐ Nature Study
☐ Roller Skating
☐ Sports (specify) ____________
☐ Other ____________

Places

☐ Museum
☐ Academy of Sciences
☐ Conservatory
☐ Tea Garden
☐ Arboretum
☐ Woods
☐ Trails
☐ Meadows

☐ Other (specify)
____
____
____

1b. How often do you visit the Park per month.

☐ Less than 1/month ☐ 1-4 ☐ 5-10 ☐ 10+

2. What form of transportation did you use to get to the Park today?

☐ Walk
☐ Bicycle
☐ Car
☐ Cab

☐ Public Transit ☐ Fast Pass
☐ Charter or Tour Bus
☐ Other (specify) ____________

a. Where did you come from today? San Francisco Resident? ☐ Yes ☐ No

____
City Street/Cross Street Zip Code

b. How many people traveled with you? ____________

c. If you arrived by Muni Transit, which line(s) did you take?

____
Line(s) Number(s) Drop off point (map zone)

d. If you arrived by car, where did you park? Refer to map zone ____________

3. On which street or path did you enter the park? Refer to map zone ____________

4. a. What time of day did you arrive in the Park? ____________

b. What time do you plan to leave the park today? ____________

5. What will be your general destination when you leave the Park today?

____
City Street/Cross Street Zip Code

6. Are there any areas in or adjacent to the Park where you feel parking is a problem?

Yes _____ No _____ Don't Know _____

a. If yes, where? Refer to map zone ____________

b. At the location with the most severe problem, indicate the primary parking problems. Check no more than two brackets.

☐ Hard to find a space.
☐ Contributes to congestion.
☐ Noisy.
☐ Is unsightly.

☐ Contributes to accidents/ Difficult to cross road.
☐ Damages Park grounds.
☐ Other (specify) ____________

7. If parking were banned on South, Middle and Kezar Drive, and free parking in the park were available with shuttles every fifteen minutes to the Concourse, what would you do to get to the park.

☐ Park on streets next to the Park and walk into the Park.

☐ Leave my car at home and take Muni to the Park.

☐ Park elsewhwere in the Park. Where? Refer to map zone. ____________

☐ Park at a free parking lot and ride the shuttle.

☐ Other ________________________________

8. If parking on South, Middle or Kezar Drive on weekends were priced at $3.00 per day and the Park and ride shuttle were operating, how would you get to the Park?

☐ Park on streets next to the Park and walk into the Park.

☐ Leave my car at home and take Muni to the Park.

☐ Park elsewhere in the Park. Where? Refer to map zone ____________

☐ Ride the shuttle.

☐ Pay $3.00 and park on South Middle or Kezar Drive.

☐ Other ________________________________ cooperation in the survey will help plan the Parks' future. All information is anonymous. Please complete this post-paid form and mail. Direct any questions to Deborah Learner at 558-3700. Use pen to check boxes.

1. What is your primary purpose in parking here?
   1. ☐ Use the park
   2. ☐ Go to work
   3. ☐ Go home
   4. ☐ Shopping
   5. ☐ Other (Specify) ____________

   ____
   Street-Cross Street Zip Code

2. When parking for the purpose checked above, what streets do you usually park on? (check one or more)
   1. ☐ Conservatory Drive
   2. ☐ Kennedy Drive
   3. ☐ Kezar Drive
   4. ☐ South Drive
   5. ☐ Middle Drive
   6. ☐ Other Park Streets

3. How many times per week do you usually park in the park for the purpose checked above?
   1. ☐ Less than 1 3. ☐ 3-5
   2. ☐ 1-2 4. ☐ 6-7

4. At what time did you park here today? __________ ☐ a.m. ☐ p.m.

5. At what time did you or will you leave here today? __________
   ☐ a.m. ☐ p.m.

6. How many people accompanied you in the vehicle when you parked here today?
   1. ☐ none 2. ☐ 1
   3. ☐ 2 3. ☐ 3 or more

7. Where did you come from today before parking here?

   ____
   City Street-Cross Street Zip Code

8. ANSWER ONLY IF PARKING TO USE THE PARK TODAY.
   If parking were prohibited or restricted to limited time periods and a park shuttle operated from a parking lot at Kezar Stadium, how would you get into the park?
   1. ☐ Park at the Kezar lot and use the shuttle.
   2. ☐ Park elsewhere in the park.
   3. ☐ Park on nearby streets outside the park.
   4. ☐ Use Muni.
   5. ☐ Other (Specify ____________
   6. ☐ Don't know.

9. ANSWER ONLY IF PARKING HERE TO GET TO WORK.
   If parking were prohibited or restricted to limited periods of time here, how would you get to work?
   1. ☐ Park elsewhere in park.
   2. ☐ Park on nearby streets outside park.
   3. ☐ As checked above and then take transit to work.
   4. ☐ Take transit for the whole trip.
   5. ☐ Drive to work and park there.
   6. ☐ Other (Specify) ____________

THANK YOU

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IN THE
UNITED STATES

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SAN FRANCISCO
RECREATION & PARK DEPT.
McLAREN LODGE
SAN FRANCISCO, CALIFORNIA 94117

City and County of San Francisco **Recreation and Park Department**

GOLDEN GATE PARK TRANSPORTATION STUDY

DATE ____________

TIME ____________

LOCATION ____________

1. What is the primary purpose of your drive through the park today?

☐ Go Home
If Home, what ______________________________
Street/Cross Street Zip Code

☐ Go to work
If work, what ______________________________
Street/Cross Street Zip Code

☐ Other ______________________________
If other, what ______________________________
Street-Cross Street Zip Code

a. If any of the above, why are you driving through the Park?

☐ sight-see
☐ faster route
☐ other ____________

☐ Park in and use the Park
If parking in and using the park, what place (s) will you visit or have you visited?

☐ Museum
☐ Conservatory
☐ Arboretum
☐ Academy of Sciences
☐ Tea Garden
☐ Stow Lake
☐ Polo Field
☐ Tennis Courts
☐ Windmill
☐ Other (specify) ______________________________

b. And where do you intend to, or have you parked?

____
state general location or map zone

2. Where did you come from on this trip today?
Can you tell me the City, ____________ Street/Cross Street ____________
Zip Code ____________ where you started your trip today?

3. At what intersection did you enter the Park? ____________________

4. At what intersection will you exit the park? ____________________

Intersection List
1. Stanyan & Fell
2. 8th & Fulton
3. 10th & Fulton
4. Park Presidio & Fulton
5. 25th & Fulton
6. 36th & Fulton
7. Great Highway
8. 9th & Lincoln
9. 19th & Lincoln
10. 25th & Lincoln
11. Sunset & South Drive
12. 41st & Lincoln

Other: Write in location ______________________________

5. How many people in vehicle, all total? ____________________

City and County of San Francisco **Recreation and Park Department**

Hora: ________
Zona: 5
Número: 561

CUESTIONARIO PARA VISITANTES DE PARQUE

Por favor ayudenos a determinar áreas de máximo uso y necesidades de transporte hacia y adentro del Parque Golden Gate, en completando las siguientes preguntas. Este cuestionario es totalmente anónimo de su parte. Hay lápices disponibles. Por favor regrese esta forma al encuestador.

1a. ¿Qué actividades llevará a cabo y qué sitios visitará usted hoy en el parque? (Marque cuentos sean apropiados)

Actividades	Sitios
☐ Correr/Trotar	☐ Museo
☐ Caminar/Pasear	☐ Academia de Ciencia
☐ Montar bicicleta	☐ Conservatorio
☐ Picnic	☐ Jardín Japonés
☐ Estudiar la Naturaleza	☐ Jardines Botánicos
☐ Patinar	☐ Otro (Especifique)
☐ Deporte (Cual?) ________	________
☐ Otro (Especifique) ________	

☐ Bosques
☐ Vereda
☐ Llanura

1b. ¿Cuántas veces visita usted el parque por mes?

☐ Menos de una vez al mes ☐ 1-4 ☐ 5-10 ☐ 10+

2. ¿Qué tipo de transporte utilizó para llegar al parque hoy?

☐ Caminar
☐ Bicicleta
☐ Auto
☐ Taxi
☐ Transporte Público
☐ Camión de Tour
☐ Otro (Especifique) ________
☐ Boleto Special

a) ¿De dónde vino hoy? Residente de San Francisco? ☐ Sí ☐ No

____
Ciudad Calle/Calles Cercanas Zona Postal (Zip)

b) ¿Cuántas personas viajaban con usted? ________

c) Si vino por Camión Municipal, qué línea/ruta tomó?

____
Línea/Ruta Número Punto de arrivo (Zona en el mapa)

d) Si vino por automóvil, dónde se estacionó (Referir al mapa)
Zona en el mapa ________

3. ¿Por cual calle o sendero entró usted al parque (Referir al mapa)

Zona en el mapa ________________

4. a. ¿A qué hora llegó al parque? ________________

b. ¿A qué hora planea irse del parque hoy?

5. ¿A qué destino irá después de irse del parque? ________________

____
Ciudad Calle/Calles Cercanas Zona Postal (Zip)

6. ¿Hay áreas adentro o cerca del parque donde usted cree que estacionarse es un problema?

Si______ No________ No sé_________

a. Si su contestación es positiva, en dónde? (Referir al mapa)

Zona en el mapa____.

b. Indique en orden de importancia el problema mas grave referiente al estacionamiento en la localidad. Marque uno o dos espacios pero no mas de dos.

☐ Dificil de encontrar espacio
☐ Mucha bulla
☐ Puede causar accidentes y dificultad en cruzar el Camino
☐ contribuye a mucho tráfico
☐ Desagradable a la vista
☐ Causa daños al parque
☐ Otras opiniones ____________

Por favor marque su respeusta a lo siguiente.

7. Si hubiera mas lugares de estacionamiento dentro del parque, y evitaran de parar carros en las calles del mismo, gozaria de la belleza de el y la seguridad aumentaria.

☐	☐	☐	☐	☐
Firmemente no de acuerdo	No de acuerdo	Neutral	De acuerdo	Firmemente de acuerdo

8. Si existiera el servicio de un autobus especial, de los lugares de estacionamiento a varios puntos dentro del parque y a precio reducido, yo usaria ese servicio.

☐	☐	☐	☐	☐	☐
Nunca	raramente	en ocasiones	seguido	siempre	no sé

9. Kennedy Drive, el cual es actualmente cerrado al tráfico de carros Los Domingos, Debería cerrarse tambien los Sábados.

☐	☐	☐	☐	☐
Firmemente no de acuerdo	No de acuerdo	Neutral	De acuerdo	Firmemente de acuerdo

10. Si hubiera transportacion pública que diera servico conveniente de su vecindad Al Museo y a La Academia de Ciencias, qué tan seguido visitaria usted estos lugares.

☐	☐	☐	☐	☐	☐
Nunca	raramente	en ocasiones	seguido	siempre	no sé

11. Algunas calles deberían ser cerradas al tráfico de carros y solamente habiertas para los ciclistas, corredores, caminantes y patinadores.

☐	☐	☐	☐	☐
Firmemente no de acuerdo	No de acuerdo	Neutral	De acuerdo	Firmemente de acuerdo

City and County of San Francisco **Recreation and Park Department**

Time:
Zone: 7
Number: D65

公园游客交通调查表

我们为熟悉各游客进入金门公园所需用交通工具情形，请依用本表所附之铅笔答复下列各问题，掷还调查员，并不需要签名，谢谢。

1a. 你今天来到金门公园做甚么？去过多少地方？（任意填足）

活动
( ) 跑步
( ) 游览
( ) 骑自行车
( ) 野餐
( ) 自然研究
( ) 有轮溜冰
( ) 运动（何种）____
( ) 其他（注明）____

地点
( ) 博物馆
( ) 科学馆
( ) 植物馆
( ) 茶园
( ) 植物园
( ) 其他（注明）
____
____
____
( ) 树林
( ) 小径
( ) 草地

1b. 你每月来公园几次.
( ) 不足一次 ( ) 一至二次 ( ) 三至十次 ( ) 十次以上

2. 你今天来公园是利用甚么交通工具？
( ) 走路
( ) 骑自行车
( ) 汽车
( ) 街车
( ) 公共汽车
( ) 游览车
( ) 其他（注明）
____

a. 你今天从何处来？
城市____ 街名____ 区域代号____

b. 有多少人同来？____

c. 假如你是搭乘市府公共汽车，你搭的是甚么车？
行驶路线____ 号码____ 下车站____（图示地区）

d. 假如你驾车来，在何处停车？（以图示地点）
地区____

3. 你入园时经过那条街？（图示地点）地区____

4. a. 你甚么时候来到公园？____
b. 你准备甚么时候离开此地？____

5. 你離開公園後打算去那裏?

城市 ______ 街名 ________ 地區代號 ________

6. 在那些地區或進入公園時途中你感覺到停車有困難

是的 ______ 不是 ______ 不知道 ______

a. 假如你的答案是'是的', 請指明地區 (同上地區)___

b. 在下列答案中, 填上 [1] 以表示最嚴重之泊車困難; 填上 [2] 以表示其次之困難. 僅填兩項, 不要多填.

[ ] 難找泊車位
[ ] 增加擠塞
[ ] 嘈雜
[ ] 不雅观
[ ] 增加失事/或難越過公路.
[ ] 破壞泊車場地
[ ] 其他(請說明)______

在每一問題下, 請選答一項: ☑

7. 在公園內有多些園內泊車位及增加園起為泊車用之街道, 則我更會享受公園之美景及安全..

☐ 極不同意 ☐ 不同意 ☐ 中立 ☐ 同意 ☐ 極同意

8. 如有車費不高及方便之接送巴士來往於停車場和公園之間, 我會乘搭這接送巴士

☐ 永不 ☐ 稀少 ☐ 間中 ☐ 經常 ☐ 總必 ☐ 不知道

9. 在星期日不許車輛來往之甘乃迪路 應在星期六也照樣禁止車輛來往.

☐ 極不同意 ☐ 不同意 ☐ 中立 ☐ 同意 ☐ 極同意

10. 從你住宅到博物館, 如有方便之公共交通工具來往, 你會經常乘搭這些交通工具嗎?

☐ 永不 ☐ 稀少 ☐ 間中 ☐ 經常 ☐ 總 ☐ 不知道

11. 有些公路應禁止車輛來往, 留為下列用途: 腳踏車, 跑步, 步行, 溜滑活動

☐ 極不同意 ☐ 不同意 ☐ 中立 ☐ 同意 ☐ 極同意

APPENDIX F

TRAFFIC AND CIRCULATION DATA

SECTION F-1 - TWENTY-FOUR HOUR TRAFFIC VOLUMES

F-2 - MANUAL TRAFFIC COUNTS

F-3 - LEVEL OF SERVICE CALCULATIONS

SECTION F-1

TWENTY-FOUR HOUR TRAFFIC VOLUMES

APPENDIX F

SECTION F-1

TRAFFIC COUNT SUMMARY (EAST PARK)

LOCATION	DAY	TWENTY-FOUR HOUR VOLUME				TOTAL	DATE
		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND		
1. Arguello South of Fulton	Tuesday	2,899	3,037	---	---	5,936	4/82
2. Tea Garden Dr. South of JFK	Wednesday	3,613	5,797	---	---	9,410	12/75
3. Waller St. West of Stanyan	Tuesday	---	---	4,969	2,127	7,096	1/79
4. Tea Garden Dr. (One-Way) North of South Dr.	Mon.-Fri. (Average)	---	9,937	---	---	9,937	5/81
	Saturday (Average)	---	11,130	---	---	11,130	5/81
	Sunday	---	3,526	---	---	3,526	5/81
5. Concourse North of South Dr.	Mon.-Fri. (Average)	6,331	---	---	---	6,331	5/81
	Saturday (Average)	6,512	---	---	---	6,512	5/81
	Sunday (Average)	1,823	---	---	---	1,823	5/81
6. 6th Ave. North of Fulton	Wednesday	1,855	1,535	---	---	3,410	1/76
7. 6th Ave. South of Fulton (Now closed)	Wednesday	1,360	1,473	---	---	2,833	11/79

APPENDIX F

SECTION F-1

TRAFFIC COUNT SUMMARY (EAST PARK)
(continued)

LOCATION	DAY	TWENTY-FOUR HOUR VOLUME				TOTAL	DATE
		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND		
8. 8th Ave. North of Fulton	Tuesday	2,205	1,503	---	---	3,708	1/76
9. 8th Ave. South of Fulton	Wednesday	3,092	2,619	---	---	5,711	11/79
10. 10th Ave. North of Fulton	Wednesday	1,453	1,667	---	---	3,120	1/76
11. 10th Ave. South of Fulton	Monday	4,074	3,658	---	---	7,732	11/79
12. 8th Ave. South of Fulton	Tues.-Thurs. (Average)	3,941	4,150	---	---	8,091	4/82 & 5/82
	Saturday	3,591	3,838	---	---	7,429	5/82
13. 10th Ave.	Tues.-Thurs. (Average)	3,883	3,623	---	---	7,506	4/82 & 5/82
	Saturday	3,375	3,002	---	---	6,377	5/82

TRAFFIC COUNT SUMMARY (EAST-WEST ROADS)

LOCATION	DAY	TWENTY-FOUR HOUR VOLUME				TOTAL	DATE
		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND		
1. Middle Dr. East East of South Dr.	Thursday	---	---	581	539	1,120	11/75
2. Middle Dr. West East of South Dr. near Metson Lake	Tuesday	---	---	1,110	1,349	2,459	2/82
3. J.F. Kennedy Dr. East of Marx Meadows	Wednesday	---	---	2,216	2,434	4,650	12/75
4. J.F. Kennedy Dr. West of 10th Ave.	Monday	---	---	3,258	4,738	7,996	12/75
5. J.F. Kennedy Dr. West of Kezar Dr.	Thursday	---	---	1,056 (Rt turn) 8,124 (Straight)	18,439 (Lt to Kezar) 10,261 (Straight)	37,880	4/78
6. J.F. Kennedy Dr. West of Stanyan St.	Monday	---	---	20,141	15,457 (Lt to Kezar) 8,042 (Straight)	43,640	5/79
	Wednesday	---	---	15,938	8,606	24,004	5/79
	Saturday	---	---	19,122	14,326 (Lt to Kezar) 6,973 (Straight)	40,421	5/79
	Sunday	---	---	15,791	14,434 (Lt to Kezar)	30,225	5/79
7. J.F. Kennedy Dr. East of 10th Ave.	Monday	---	---	4,366	5,426	9,792	5/82

TRAFFIC COUNT SUMMARY (EAST-WEST ROADS)
(continued)

LOCATION	DAY	TWENTY-FOUR HOUR VOLUME				TOTAL	DATE
		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND		
8. South Dr. East of 25th Ave.	Thursday	---	---	6,946	4,575	11,521	12/75
9. South Dr. West of 41st Ave.	Saturday	---	---	2,052	---	2,052	3/79
	Sunday	---	---	3,536	---	3,536	3/79
10. South Dr. East of 41st Ave.	Saturday	---	---	---	4,352	4,352	3/79
	Sunday	---	---	---	5,578	5,578	3/79
11. South Dr. East of Great Hwy.	Saturday	---	---	566	1,482	2,048	10/79
	Sunday	---	---	580	1,388	1,968	10/79
	Monday	---	---	452	1,135	1,587	10/79
12. South Dr. East of Tea Garden	Mon-Fri (Average)	---	---	9,177	2,217	11,394	Week of 5/16-24/81
	Saturday (Average)	---	---	9,786	2,514	12,300	Week of 5/16-24/81
	Sunday (Average)	---	---	6,484	4,541	11,025	Week of 5/16-24/81
13. South Dr. West of 7th Ave.	Thursday	---	---	1,429	1,880	3,309	4/82

TRAFFIC COUNT SUMMARY (NORTH-SOUTH ROADS)

LOCATION	DAY	TWENTY-FOUR HOUR VOLUME				TOTAL	DATE
		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND		
1. Chain of Lakes West South of Fulton St.	Tuesday	---	---	- 296 -		296	4/82
2. Chain of Lakes East North of South Dr.	Monday	4,497	4,765	---	---	9,262	3/78
3. Transverse Dr. North of JFK Dr.	Saturday	2,449	2,077	---	---	4,526	11/79
	Sunday	2,189	2,189	---	---	4,378	11/79
	Monday	2,169	2,302	---	---	4,471	11/79
4. Transverse Dr. South of Overlook Dr.	Tuesday	2,205	3,304	---	---	5,509	2/82
5. Marx Meadows* West of Crossover Dr.	Weekend (Average)	---	---	578	567	1,145	11/79
	Monday	---	---	451	513	964	11/79
6. 19th Ave. North of Lincoln	Thursday	29,426	26,848	---	---	56,274	2/72
7. Crossover Dr. East of 25th Ave.	Wednesday	7,908	6,977	---	---	14,885	12/75
8. Kezar Dr. South of JFK Dr.	Thursday	16,987	---	---	---	16,987	4/78

---

*Road closed, 1981

TRAFFIC COUNT SUMMARY (PERIPHERAL ROADS)

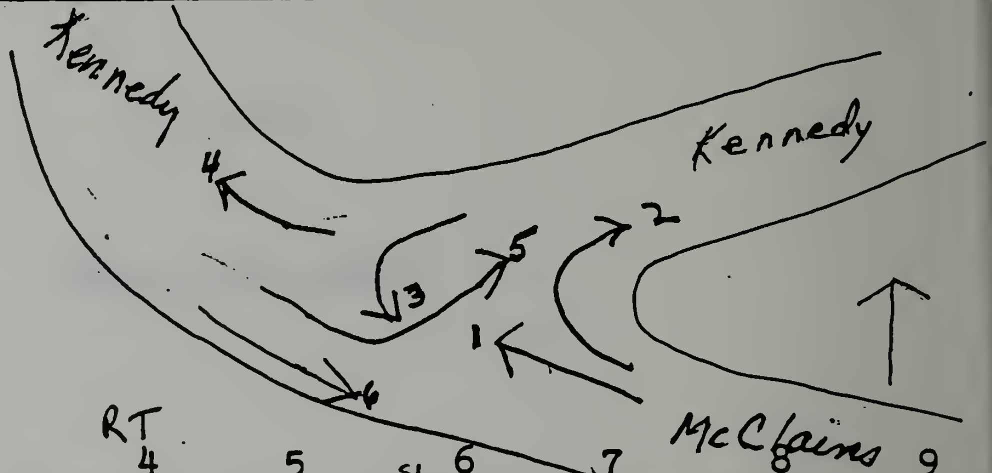
LOCATION	DAY	TWENTY-FOUR HOUR VOLUME				TOTAL	DATE
		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND		
1. Fulton St. West of 10th Ave.	Monday	---	---	10,053	9,219	19,272	3/82
2. Lincoln Way East of 6th Ave.	Wednesday	---	---	20,154	17,109	37,263	4/82
	Thursday	---	---	20,379	17,290	37,669	4/82
3. Lincoln Way East of 8th Ave.	Tuesday	---	---	N/A	13,629		4/82
	Wednesday	---	---	17,013	13,765	30,778	4/82
4. Fell St. East of Stanyan	Wednesday	---	---	---	21,679 (to JFK) 4,811 (Side St.)	26,490	5/79
	Saturday	---	---	---	18,186 (to JFK) 4,521 (Side St.)	22,707	5/79
	Sunday	---	---	---	16,192 (to JFK) 5,118 (Side St.)	21,310	5/79
5. Oak St. East of Stanyan	Wednesday	---	---	18,914 (from JFK) 5,598 (Side St.)	---	24,512	5/79
	Saturday			16,993 (from JFK) 5,138 (Side St.)	---	22,131	5/79
	Sunday			14,000 (from JFK) 5,661 (Side St.)	---	19,661	5/79

SECTION F-2

MANUAL TRAFFIC COUNTS

CITY AND COUNTY OF SAN FRANCISCO
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION Kennedy & Mc Clains
DAY & DATE Friday 4.9.82 TIME: FROM 4:00pm TO 4:45 pm
OBSERVER D. Learner RECORDER D. Learner WEATHER hazy/wa
REMARKS Good Friday



TIME	1	2	3	RT 4	5	St 6	7	8	9
4:00	20	1	5	61	24	24			
4:15	29	3	2	52	28	22			
4:30	35	0	6	62	25	31			

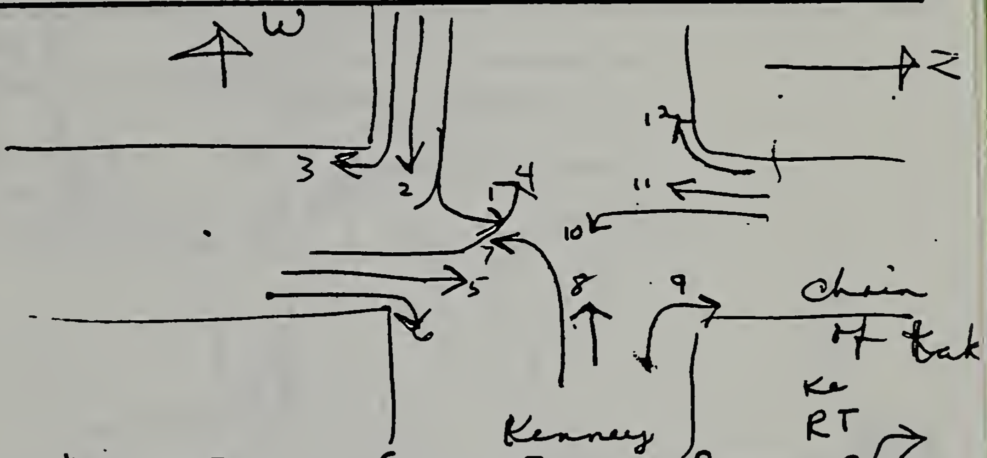
CITY AND COUNTY OF SAN FRANCISCO
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION Kennedy / Chain of Lakes

DAY & DATE Mon 4.12 TIME: FROM 4:15 TO 6 pm

OBSERVER D. Leaver RECORDER WEATHER mild - partly cloudy

REMARKS

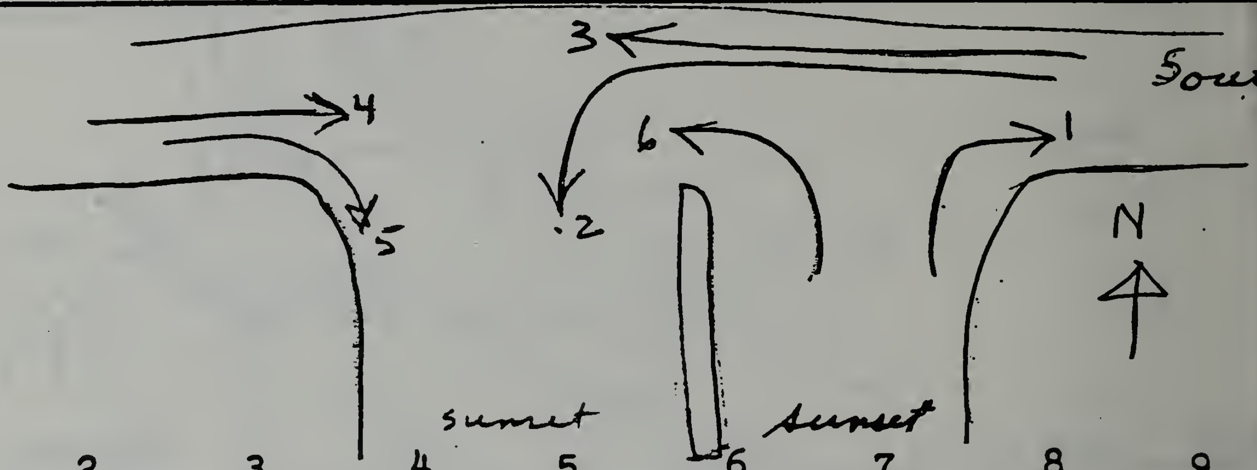


TIME	1	2	3	4	5	6	7	8	9 Ke RT
415	2	13	3	4	61	33	37	39	||2
430	3	18	2	0	50	31	47	34	卌 5
445	1	7	2	1	54	38	50	25	卌 5
500	1	11	1	5	54	29	73	36	||||4
5.15	4	4	1	3	65	31	63	27	卌|| 7
530	2	9	3	0	44	32	64	25	||| 3
545	2	11	3	0	66	34	51	23	卌|||| 9
415	10	11	12						
	ch LT	ch st	RT						
	|| 卌	卌|	||||			10	11	12	
	|| 卌|||	卌 卌			415	10	70	3	
		卌 卌卌			430	6	94	3	
		卌卌 卌卌			445	11	69	1	
		卌 卌			500	6	67	2	
		卌 |||			515	5	60	3	
					530	2	69	0	
					545	3	71	0	

LOCATION

CITY AND COUNTY OF SAN FRANCISCO
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION Sunset and South
DAY & DATE Monday 4-12 TIME: FROM 7:15 . TO 8:15
OBSERVER ____ RECORDER D Learner WEATHER Sunny
REMARKS ____



TIME	1	2	3	4	5	6	7	8	9
715	114	49	8	14	41	52			
730	144	83	08	17	45	56			
745	124	75	6	9	47	60			
800	140	70	5	11	42	40			

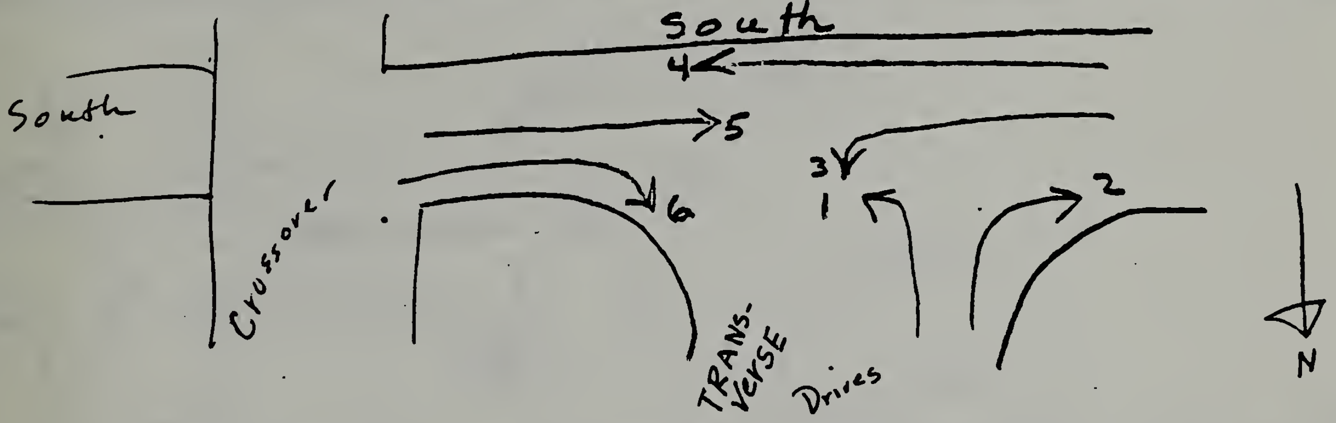
CITY AND COUNTY OF SAN FRANCISCO
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION South / Transverse

DAY & DATE Monday 4/19/82 TIME: FROM ________ TO ________

OBSERVER ________ RECORDER D Learner WEATHER Clear / Sunn

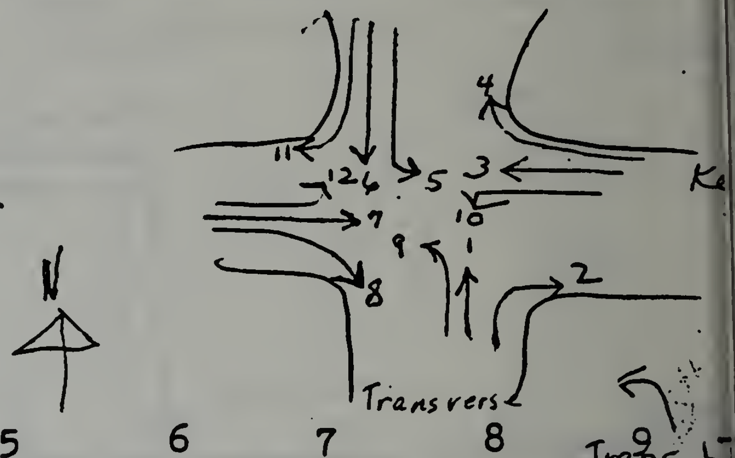
REMARKS some "U" turn made by "6" and then joining "4"



TIME	1	2	3	4	5	6	7	8	9
9 10	2	15	24	181	68	8			
7 25	8	18	24	200	70	6			
7 40	15	33	31	227	108	08			
7 55	10	21	20	187	94	08			
8 10	14	27	31	197	80	05			
8 25	14	25	37	163	83	07			
8 40	14	22	27	139	81	06			

CITY AND COUNTY OF SAN FRANCISCO
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

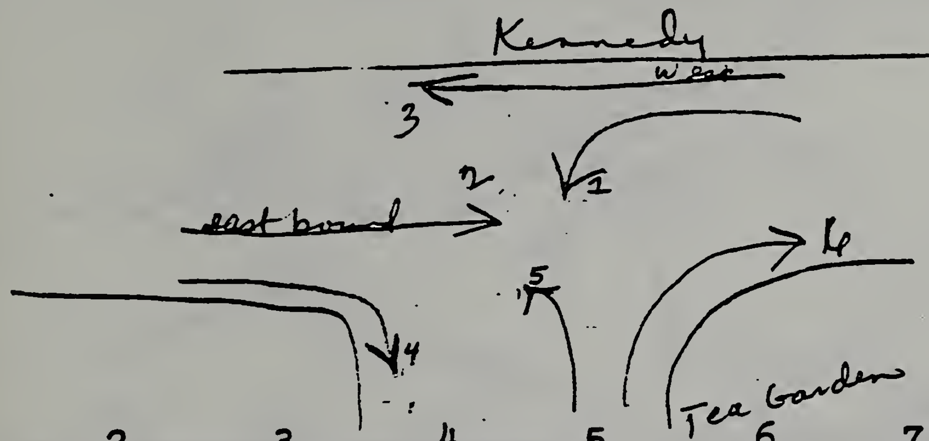
LOCATION Kennedy / Transverse
DAY & DATE Tuesday 4.20 TIME: FROM 710. TO 850
OBSERVER RECORDER D. Learned WEATHER Clear Sun
REMARKS 7:10 - 720 - 10 minutes only



TIME	1	2	3	4	5	6	7	8	9 Trans
7~~05~~ 10	9	30	18	4					|||| 3
720	16	64	35	08	25	31	77	64	||||
735	7	79	35	05	42	32	106	04	
750	21	66	34	16	31	31	68	6	|||
805	21	43	24	13	28	22	64	03	||||
820	34	48	30	14	27	30	55	05	||
835	24	28	33	05	25	39	44	03	||
850									
	10	11	12						
705	2	4	4						
720	𝍸 |||| 9	|							
735	𝍸 𝍸 𝍸 15	||||| 4	|| 2						
750	𝍸 | 𝍸 𝍸 16	||||| 4	|						
805	𝍸 𝍸 |||| 14	|	|						
820	𝍸 |||| 𝍸 𝍸 19	||||| 4	|| 2						
835	𝍸 𝍸 𝍸 𝍸 20	||||| 4	||| 3						
850									

CITY AND COUNTY OF SAN FRANCISCO
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

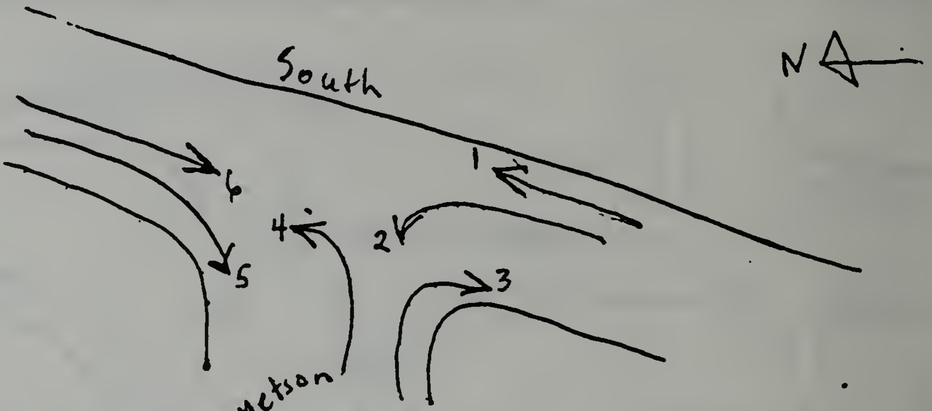
LOCATION Kennedy / Tea Garden
DAY & DATE 4.11..82 TIME: FROM 4:15 pm TO 6 pm
OBSERVER RECORDER D Leaver WEATHER Windy Partly Cloudy
REMARKS



TIME	1	2	3	4	5	6	7	8	9
415	86	65	171	38	22	63			
430	101	75	208	32	44	66			
445	109	64	192	45	19	62			
500	127	73	228	32	46	82			
515	101	63	206	46	41	49			
530	125	76	205	44	34	59			
545	143	76	157	35	31	44			

TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION Metson / South
DAY & DATE Tues 4.13.82 TIME: FROM 7:10 TO 8:46 am
OBSERVER RECORDER D. Learner WEATHER temperate cloudy
REMARKS about to rain - but didn't



TIME	1	2	3	4	5	6	7	8	9
7 10	113	22	7	0	3	42			
25	143	28	15	2	6	60			
40	145	39	10	4	1	73			
55	107	17	19	3	2	58			
8 10	99	23	8	5	1	59			
8 25	96	19	10	4	0	72			
8 40									
8 55									

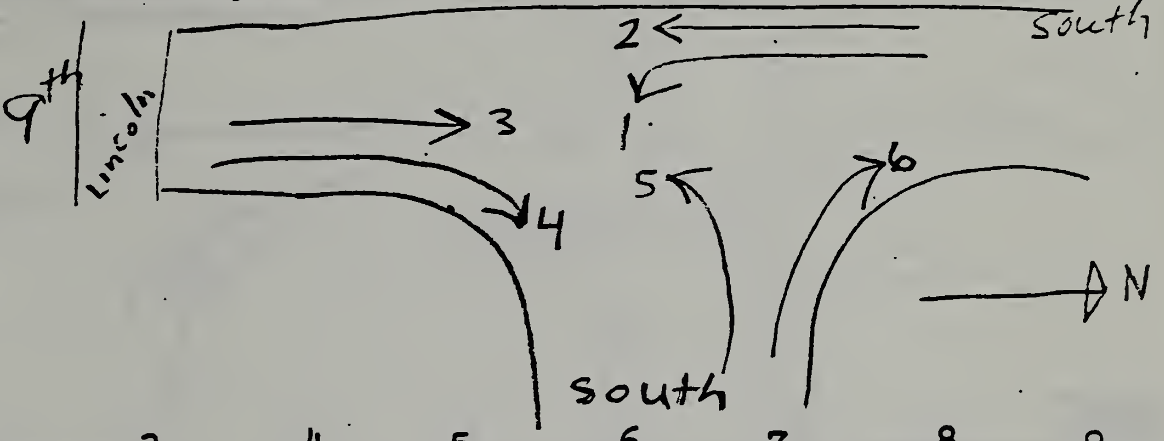
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION South & 9th

DAY & DATE 4.16.82 TIME: FROM 6:55 am TO 8:47.5 am

OBSERVER RECORDER D Learner WEATHER clear/Sun

REMARKS 840 count 7½ minutes - then doubled
#5, #6 high percentage of vehicles from Park Corporation [illegible].



TIME	1	2	3	4	5	6	7	8	9
655	11	34	40	6	0	1			
710	13	45	77	9	3	4			
725	16	74	74	13	1	4			
740	30	96	161	11	2	2			
755	12	61	88	8	2	9			
810	11	75	103	16	2	14			
825	11	72	89	8	3	15			
840	10	104	66	4	2	12			

LOCATION

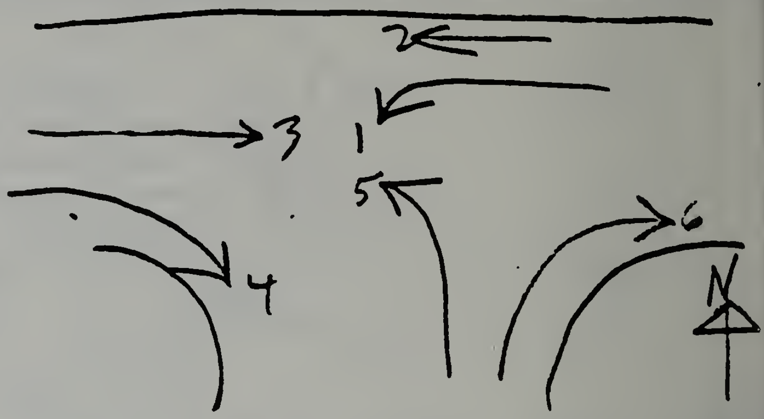
TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION Kennedy / Middle Drive East

DAY & DATE Friday /16 TIME: FROM 405 pm TO 6:20 pm

OBSERVER RECORDER D. Learner WEATHER Clear/Sun

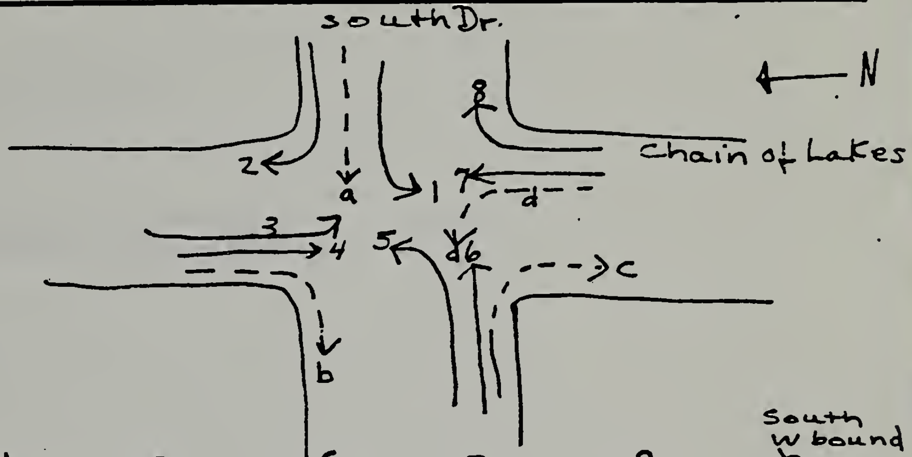
REMARKS #2 steady flow, very little back up



TIME	1	2	3	4	5	6	7	8	9
405	22	197	108	11	18	33			
420	31	180	80	21	18	32			
435	30	243	106	13	15	27			
450	33	213	90	16	13	30			
505	40	235	89	18	14	24			
520	38	250	74	16	9	25			
535	25	238	80	11	13	23			
550	21	193	68	18	10	24			
605	21	191	80	15	10	14			

TRAFFIC ENGINEERING
TRAFFIC HANDCOUNTS

LOCATION South Drive and Chain of Lakes (41st Ave
DAY & DATE Tuesday, June 22 TIME: FROM 7³⁰ TO 9am
OBSERVER D. Learner RECORDER Deborah Learner WEATHER Cloudy
REMARKS



TIME	1	2	3	4	5	6	7	8	South W bound ~~9~~ a
Start 730	3	33	29	21	6	8	84	24	3
745	5	43	28	38	5	13	55	17	9
800	4	30	28	36	5	10	63	22	9
815	4	24	29	23	5	9	56	16	2
830	6	33	29	37	6	11	47	6	8
845	5	44	31	23	4	7	33	9	8
	Chain b RT	South RT c	Chain d LT						
Start. 730	1	2	4						
745	1	4	5						
800	0	4	2						
815	0	2	4						
830	0	5	2						
845	0	4	3						

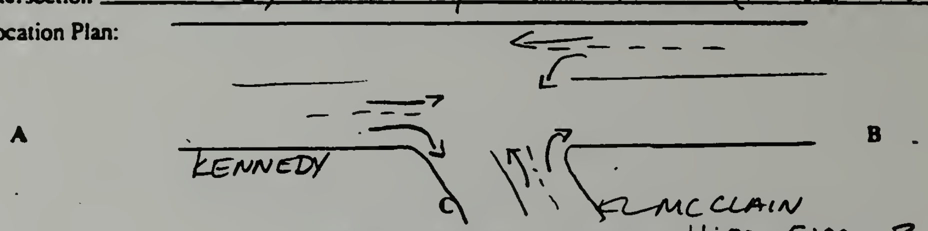
SECTION F-3

LEVEL OF SERVICE CALCULATIONS

Unsignalized "T" Intersection Capacity Calculation Form

Intersection KENNEDY DRIVE & SOUTH FORK (MCCLAIN DR) SKEWED T

Location Plan:



Counts:
Date 4-9-82
Day FRIDAY *
Time 4:00-5:00 PM
Control YIELD
Prevailing Speed 30mph +

Hourly Demand Traffic Volumes from 4:00 to 5:00, P m

Approach	A		B		C	
Movement	A_T	A_R	B_L	B_T	C_L	C_R
Volume	107	114	20	249	126	8
pch (see Table 1)			22		139	9

Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2} A_R + A_T$ = 57 + 107 = 164 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{Ne} = M_1$ = >1000 pch
	Shared Lane – See Step 3	
✓	No Shared Lane Demand =	C_R = 9 pch
	Available Reserve =	$M_1 - C_R$ = 991 pch
	Delay & Level of Service (Table 3)	No Delays A
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	$A_R + A_T$ = 114 + 107 = 221 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{Ne} = M_2$ = 960 pch
	Demand =	B_L = 22 pch
	Capacity Used =	$100 (B_L/M_2)$ = 2 %
	Impedance Factor from Fig. 3 =	P_2 = 0.99
	Available Reserve =	$M_2 - B_L$ = 938 pch
	Delay & Level of Service (Table 3)	No Delays A
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2} A_R + A_T + B_L + B_T$ = 57 + 107 + 20 + 249 = 433 vph
	Critical Gap from Table 2 T_g =	6.5 sec
	Capacity from Fig. 2 =	M_{Ne} = 520 pch
	Adjust for Impedance	$M_{Ne} \times P_2 = M_3$ = 515 pch
✓	No Shared Lane Demand =	C_L = 139 pch
	Available Reserve =	$M_3 - C_L$ = 376 pch
	Delay & Level of Service (Table 3)	Short Delays B/A
	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = pch
	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = pch
	Available Reserve =	$M_{13} - C_{RL}$ = pch
	Delay & Level of Service (Table 3)	

Overall Evaluation The geometry of this intersection combined with limited sight distance results in a lower LOS for McClain Road, than the calculated value.

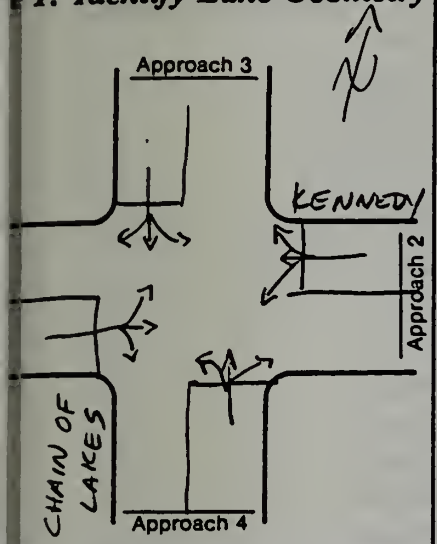
* Counted on Good Friday.

Critical Movement Analysis: PLANNING
Calculation Form 1

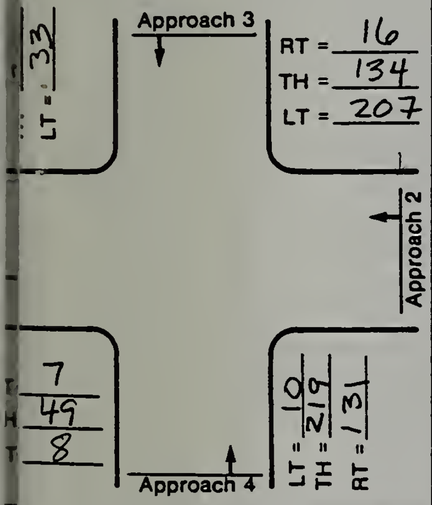
rsection Kennedy Drive at Chain of Lakes East **Design Hour** 4:15 – 5:15 Pm

blem Statement ______

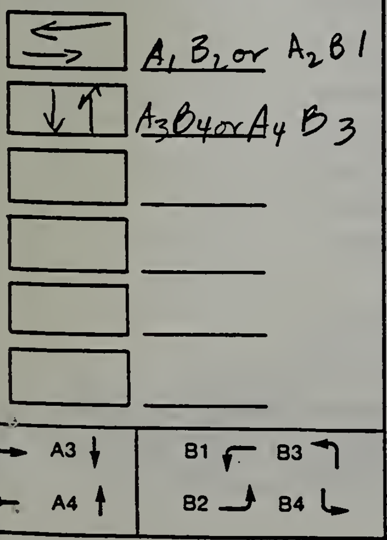
1. *Identify Lane Geometry*



2. *Identify Volumes, in vph*



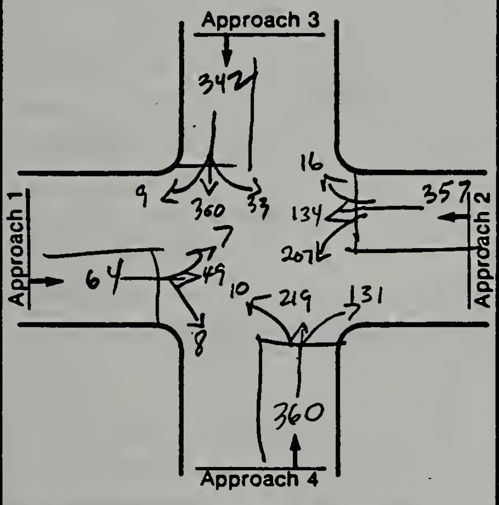
3. *Identify Phasing*



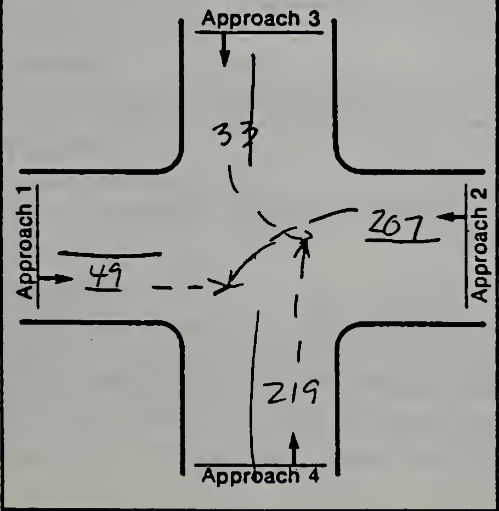
Step 4. *Left Turn Check*

	Approach 1	2	3	4
a. Number of change intervals per hour	40	40	40	40
b. Left turn capacity on change interval, in vph	80	80	80	80
c. G/C Ratio	.45	.45	.55	.55
d. Opposing volume in vph	150	57	350	309
e. Left turn capacity on green, in vph	390	483	310	351
f. Left turn capacity in vph (b + e)	470	563	390	431
g. Left turn volume in vph	7	207	33	10
h. Is volume > capacity (g > f)?	No	No	No	No

Step 5. *Assign Lane Volumes, in vph*



Step 6a. *Critical Volumes, in vph (two phase signal)*



Step 6b. *Volume Adjustment for Multiphase Signal Overlap*

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph
	2 φ		

Step 7. *Sum of Critical Volumes*

49 + 207 + 219 + 33 = 508 vph

Step 8. *Intersection Level of Service*

(compare Step 7 with Table 6)

A

Step 9. *Recalculate*

Geometric Change None

Signal Change Reqd

Volume Change ______

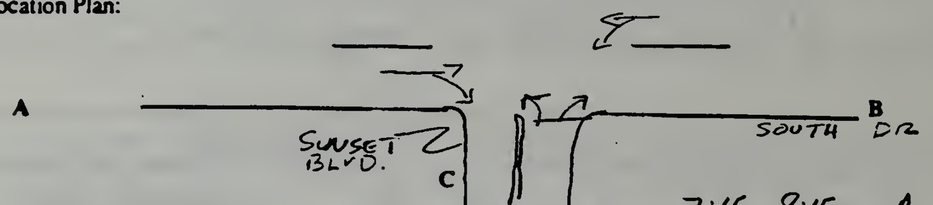
Comments

Assuming a two-phase signal with priority to Kennedy (G/C = .55), LOS at intersection would be A. Actual LOS is A and better due to the greater flexibility provided by 4-way stop vs the 2 phase signal i.e. 4 r.t's can be made simultaneously whereas a signal would only allow 2 r t's.

Unsignalized "T" Intersection Capacity Calculation Form

Intersection SOUTH DRIVE & SUNSET

Location Plan:



Counts:
Date 4/12/82
Day Monday
Time 7:15 - 8:15 AM
Control Stop (Assumed on Sunset
Prevailing Speed 30 mph

Hourly Demand Traffic Volumes from 7:15 to 8:15 A m

Approach	A		B		C	
Movement	A_T →	A_R ↘	B_L ↱	B_T ←	C_L ↰	C_R ↱
Volume	51	175	347	27	208	522
pch (see Table 1)			382		229	574

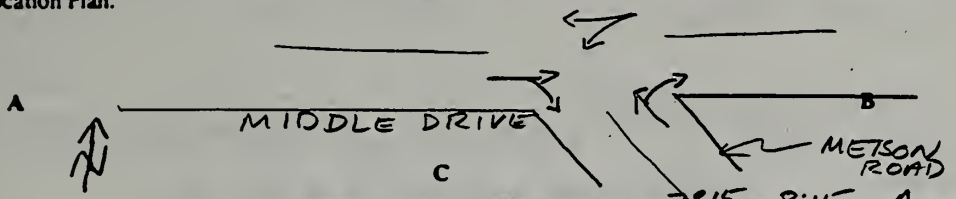
Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	½ A_R + A_T = 88 + 51 = 139 vph
	Critical Gap from Table 2 T_g =	6.0 sec
	Capacity from Fig. 2 =	$M_{No} = M_1$ = 875 pch
___	Shared Lane – See Step 3	
✓	No Shared Lane Demand =	C_R = 574 pch
	Available Reserve =	$M_1 - C_R$ = 301 pch
	Delay & Level of Service (Table 3)	Short Delays B
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	A_R + A_T = 175 + 51 = 226 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{No} = M_2$ = 950 pch
	Demand =	B_L = 382 pch
	Capacity Used =	100 (B_L/M_2) = 40 %
	Impedance Factor from Fig. 3 =	P_2 = 0.69
	Available Reserve =	$M_2 - B_L$ = 568 pch
	Delay & Level of Service (Table 3)	No Delays A
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	½A_R + A_T + B_L + B_T = 88 + 51 + 347 + 27 = 513 vph
	Critical Gap from Table 2 T_g =	7.5 sec
	Capacity from Fig. 2 =	M_{No} = 385 pch
	Adjust for Impedance	$M_{No} \times P_2 = M_3$ = 266 pch
✓	No Shared Lane Demand =	C_L = 229 pch
	Available Reserve =	$M_3 - C_L$ = 37 pch
	Delay & Level of Service (Table 3)	Very Long Delays E
	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = ___ pch
___	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = ___ pch
	Available Reserve =	$M_{13} - C_{RL}$ = ___ pch
	Delay & Level of Service (Table 3)	___ ☐

Overall Evaluation Since it was assumed that no Stop on South Drive (although stops are in place) LOS on South is probably lower (B to A) and LOS on Sunset for Left Turns is probably higher. (C to E)

Unsignalized "T" Intersection Capacity Calculation Form

Intersection MIDDLE DRIVE & METSON (SKEWED T)

Location Plan:



Counts:
Date 4/14/82
Day Wednesday
Time 7:15-8:15 AM
Control YIELD
Prevailing Speed 30mph

Hourly Demand Traffic Volumes from 7:15 to 8:15 A m

Approach	A		B		C	
Movement	A_T ←	A_R ↘	B_L ↱	B_T ←	C_L ↰	C_R ↗
Volume	113	7	41	18	4	103
pch (see Table 1)			45		5	113

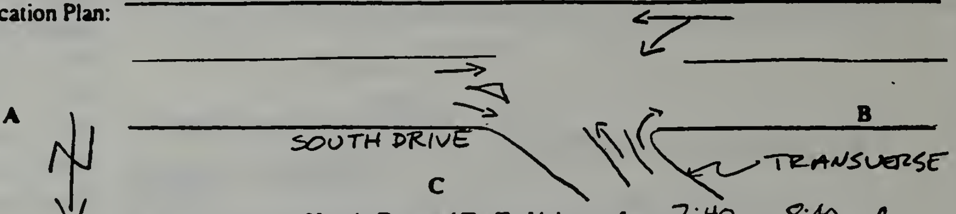
Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	½ A_R + A_T = 4 + 113 = 117 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{N_0} = M_1$ = >1000 pch
✓	Shared Lane – See Step 3	
___	No Shared Lane Demand =	C_R = ___ pch
	Available Reserve =	$M_1 - C_R$ = ___ pch
	Delay & Level of Service (Table 3)	☐
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	A_R + A_T = 7 + 113 = 120 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{N_0} = M_2$ = >1000 pch
	Demand =	B_L = 45 pch
	Capacity Used =	100 (B_L/M_2) = <5 %
	Impedance Factor from Fig. 3 =	P_2 = 0.98
	Available Reserve =	$M_2 - B_L$ = >950 pch
	Delay & Level of Service (Table 3)	No Delays A
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	½A_R + A_T + B_L + B_T = 4 + 113 + 41 + 18 = 176 vph
	Critical Gap from Table 2 T_g =	6.5 sec
	Capacity from Fig. 2 =	M_{N_0} = 750 pch
	Adjust for Impedance	$M_{N_0} \times P_2 = M_3$ = 735 pch
___	No Shared Lane Demand =	C_L = ___ pch
	Available Reserve =	$M_3 - C_L$ = ___ pch
	Delay & Level of Service (Table 3)	☐
✓	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = 118 pch
	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = 985 pch
	Available Reserve =	$M_{13} - C_{RL}$ = 867 pch
	Delay & Level of Service (Table 3)	No Delays A

Overall Evaluation Intersection operates well below capacity

Unsignalized "T" Intersection Capacity Calculation Form

Intersection SOUTH DRIVE & TRANSVERSE (SKEWED T)

Location Plan:



Counts:
Date 4/19/82
Day Monday
Time 7:40 to 8:40 AM
Control YIELD
Prevailing Speed 30 mph

Hourly Demand Traffic Volumes from 7:40 to 8:40. A m

Approach	A		B		C	
Movement	A_T →	A_R ↘	B_L ↱	B_T ←	C_L ↰	C_R ↱
Volume	366	28	119	774	57	106
pch (see Table 1)			131		63	117

Step 1	**Right Turn from C**	C_R ↱
	Conflicting Flows = M_H = (from Fig. 1)	½ A_R + A_T = 14 + 366 = 380 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{Ne} = M_1$ = 800 pch
___	Shared Lane – See Step 3	
✓	No Shared Lane Demand =	C_R = 117 pch
	Available Reserve =	$M_1 - C_R$ = 683 pch
	Delay & Level of Service (Table 3)	No Delay A
Step 2	**Left Turn from B**	B_L ↱
	Conflicting Flows = M_H = (from Fig. 1)	A_R + A_T = 28 + 366 = 394 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{Ne} = M_2$ = 795 pch
	Demand =	B_L = 131 pch
	Capacity Used =	$100 (B_L/M_2)$ = 16 %
	Impedance Factor from Fig. 3 =	P_2 = 0.89
	Available Reserve =	$M_2 - B_L$ = 664 pch
	Delay & Level of Service (Table 3)	No Delay A
Step 3	**Left Turn from C**	C_L ↰
	Conflicting Flows = M_H = (from Fig. 1)	½A_R + A_T + B_L + B_T = 14 + 366 + 119 + 774 = 1273 vph
	Critical Gap from Table 2 T_g =	6.5 sec
	Capacity from Fig. 2 =	M_{Ne} = 150 pch
	Adjust for Impedance	$M_{Ne} \times P_2 = M_3$ = 134 pch
✓	No Shared Lane Demand =	C_L = 63 pch
	Available Reserve =	$M_3 - C_L$ = 71 pch
	Delay & Level of Service (Table 3)	Long Delays E
	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = ___ pch
___	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = ___ pch
	Available Reserve =	$M_{13} - C_{RL}$ = ___ pch
	Delay & Level of Service (Table 3)	___ ☐

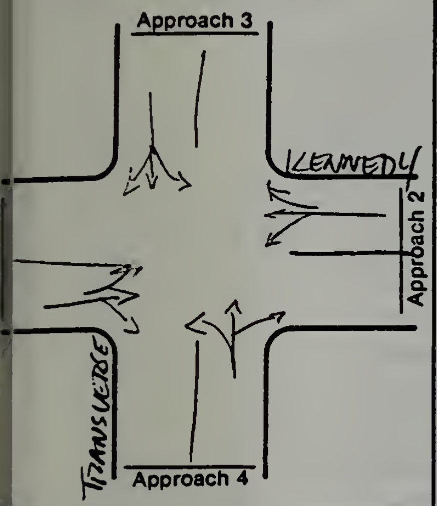
Overall Evaluation Long delays are experienced by drivers attempting to turn left from Transverse Drive to South Dr.

Critical Movement Analysis: PLANNING
Calculation Form 1

ersection KENNEDY & TRANSVERSE **Design Hour** 7:35 - 8:35 Am

blem Statement ________________

1. Identify Lane Geometry



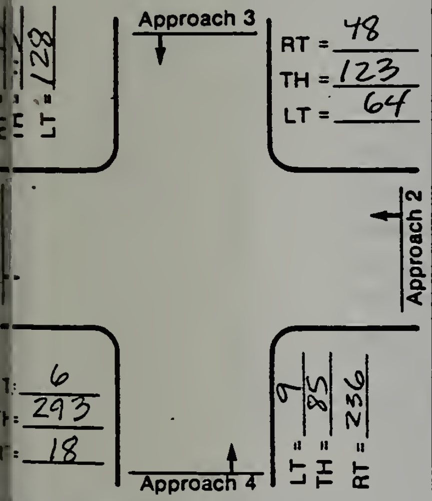
Step 4. Left Turn Check

	Approach 1	2	3	4
a. Number of change intervals per hour	40	40	40	40
b. Left turn capacity on change interval, in vph	80	80	80	80
c. G/C Ratio	.55	.55	.45	.45
d. Opposing volume in vph	171	311	321	128
e. Left turn capacity on green, in vph	489	349	219	412
f. Left turn capacity in vph (b + e)	569	429	299	492
g. Left turn volume in vph	6	64	128	9
h. Is volume > capacity (g > f)?	No	No	No	No

Step 6b. Volume Adjustment for Multiphase Signal Overlap

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph
	2 ϕ		

2. Identify Volumes, in vph



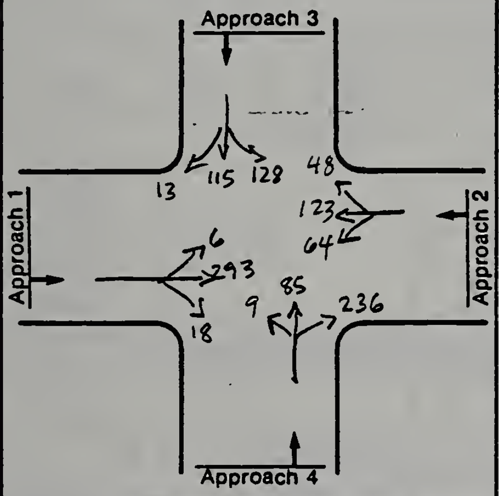
LT = 128

RT = 48
TH = 123
LT = 64

6
293
18

LT = 9
TH = 85
RT = 236

Step 5. Assign Lane Volumes, in vph



Step 7. Sum of Critical Volumes

293 + 64 + 128 + 85

= 570 vph

Step 8. Intersection Level of Service

(compare Step 7 with Table 6)

A

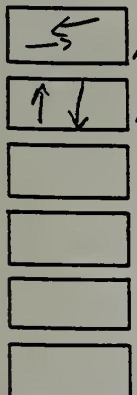
Step 9. Recalculate

Geometric Change None

Signal Change Req'd

Volume Change ________

3. Identify Phasing

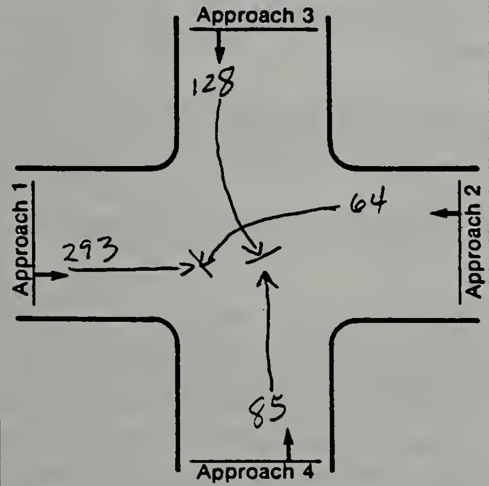


A1B2 or A2B1

A3B4 or A4B3

1 →	A3 ↓	B1 ↱	B3 ↰
2 ←	A4 ↑	B2 ↗	B4 ↳

Step 6a. Critical Volumes, in vph (two phase signal)



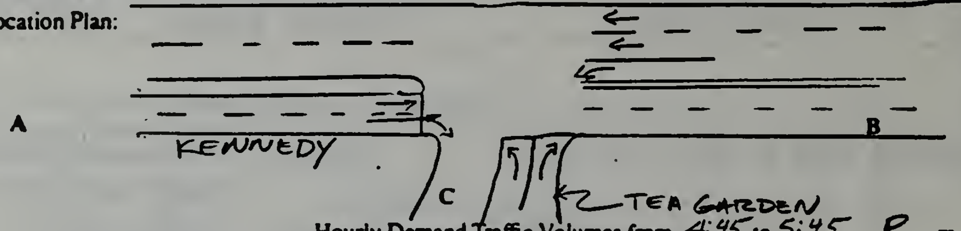
Comments

LOS calc assumes a 2 phase signal with priority to Kennedy (G/C = .55). Actual LOS at existing 4-way stop is probably at least A, due to increased flexibility for simultaneous right turns allowed at all approaches, whereas a signal would only allow 2 rts.

Unsignalized "T" Intersection Capacity Calculation Form

Intersection KENNEDY DRIVE & TEA GARDEN

Location Plan:



Counts:
Date 4/10/82
Day Saturday
Time 4:45 to 5:45 PM
Control STOP
Prevailing Speed 30 mph

Hourly Demand Traffic Volumes from 4:45 to 5:45 . P m

Approach	A		B		C	
Movement	A_T	A_R	B_L	B_T	C_L	C_R
Volume	276	167	462	831	140	251
pch (see Table 1)			508		154	276

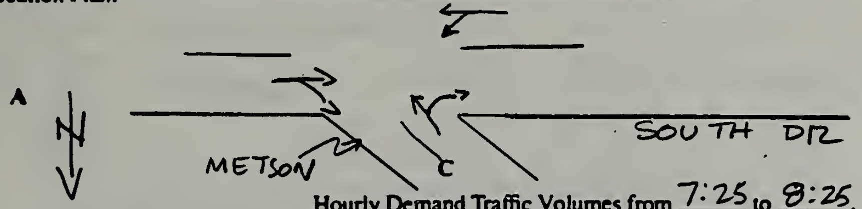
Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2}A_R + A_T$ = 84 + 276 = 360 vph
	Critical Gap from Table 2 T_g =	6.0 sec
	Capacity from Fig. 2 =	$M_{No} = M_1$ = 650 pch
___	Shared Lane – See Step 3	
✓	No Shared Lane Demand =	C_R = 276 pch
	Available Reserve =	$M_1 - C_R$ = 374 pch
	Delay & Level of Service (Table 3)	Short Delays B
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	$A_R + A_T$ = 167 + 276 = 443 vph
	Critical Gap from Table 2 T_g =	5.5 sec
	Capacity from Fig. 2 =	$M_{No} = M_2$ = 650 pch
	Demand =	B_L = 508 pch
	Capacity Used =	$100 (B_L/M_2)$ = 78 %
	Impedance Factor from Fig. 3 =	P_2 = 0.30
	Available Reserve =	$M_2 - B_L$ = 142 pch
	Delay & Level of Service (Table 3)	Long Delays D
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2}A_R + A_T + B_L + B_T$ = 84 + 276 + 462 + 831 = 1653 vph
	Critical Gap from Table 2 T_g =	8.0 sec
	Capacity from Fig. 2 =	M_{No} = 50 pch
	Adjust for Impedance	$M_{No} \times P_2 = M_3$ = 15 pch
✓	No Shared Lane Demand =	C_L = 154 pch
	Available Reserve =	$M_3 - C_L$ = -140 pch
	Delay & Level of Service (Table 3)	Jammed F
	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = ___ pch
___	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = ___ pch
	Available Reserve =	$M_{13} - C_{RL}$ = ___ pch
	Delay & Level of Service (Table 3)	___ ☐

Overall Evaluation Intersection operates with long queues on Kennedy Drive and excessive delays for left-turning vehicles on Tea Garden Drive, during weekend PM peak hour. Stop Sign for B_L may be required to alleviate delays on C_L

Unsignalized "T" Intersection Capacity Calculation Form

Intersection SOUTH DRIVE & METSON ROAD (SKEWED T)

Location Plan:



Counts:
Date 4/13/82
Day Tues
Time 7:25 - 8:25 AM
Control Yield
Prevailing Speed 30 mph

Hourly Demand Traffic Volumes from 7:25 to 8:25. A m

Approach	A		B		C	
Movement	A_T ←	A_R	B_L	B_T ←	C_L	C_R
Volume	250	10	107	464	14	52
pch (see Table 1)			118		15	57

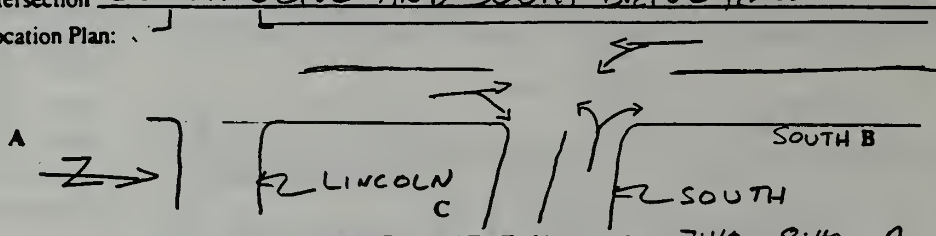
Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2} A_R + A_T =$ 5 + 125 = 130 vph
	Critical Gap from Table 2 T_g =	6.0 sec
	Capacity from Fig. 2 =	$M_{No} = M_1 =$ 850 pch
✓	Shared Lane – See Step 3	
	No Shared Lane Demand =	$C_R =$ ____ pch
	Available Reserve =	$M_1 - C_R =$ ____ pch
	Delay & Level of Service (Table 3)	☐
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	$A_R + A_T =$ 10 + 250 = 260 vph
	Critical Gap from Table 2 T_g =	5.5 sec
	Capacity from Fig. 2 =	$M_{No} = M_2 =$ 830 pch
	Demand =	$B_L =$ 118 pch
	Capacity Used =	$100 (B_L/M_2) =$ 14 %
	Impedance Factor from Fig. 3 =	$P_2 =$ 0.90
	Available Reserve =	$M_2 - B_L =$ 712 pch
	Delay & Level of Service (Table 3)	No Delay A
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2} A_R + A_T + B_L + B_T =$ 5 + 250 + 107 + 464 = 826 vph
	Critical Gap from Table 2 T_g =	8.0 sec
	Capacity from Fig. 2 =	$M_{No} =$ 190 pch
	Adjust for Impedance	$M_{No} \times P_2 = M_3 =$ ____ pch
	No Shared Lane Demand =	$C_L =$ ____ pch
	Available Reserve =	$M_3 - C_L =$ ____ pch
	Delay & Level of Service (Table 3)	☐
✓	Shared Lane Demand =	$C_R + C_L = C_{RL} =$ 72 pch
	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ $M_{13} =$ 465 pch
	Available Reserve =	$M_{13} - C_{RL} =$ 393 pch
	Delay & Level of Service (Table 3)	Short Delays B

Overall Evaluation High LOS at intersection

Unsignalized "T" Intersection Capacity Calculation Form

Intersection SOUTH DRIVE AND SOUTH DRIVE, (Near Lincoln)

Location Plan:



Counts:
Date 4/16/82
Day FRIDAY
Time 7:40 to 8:40 AM
Control YIELD
Prevailing Speed 30 mph

Hourly Demand Traffic Volumes from 7:40 to 8:40. A m

Approach	A		B		C	
Movement	A_T →	A_R	B_L	B_T ←	C_L	C_R
Volume	381	37	64	304	9	40
pch (see Table 1)			70		10	44

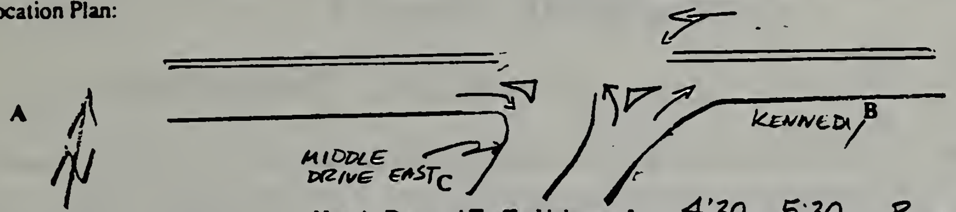
Step 1 **Right Turn from C**	C_R
Conflicting Flows = M_H = (from Fig. 1)	½ A_R + A_T = 19 + 381 = 400 vph
Critical Gap from Table 2 T_g =	5.0 sec
Capacity from Fig. 2 =	$M_{No} = M_1$ = 790 pch
✓ Shared Lane – See Step 3	
___ No Shared Lane Demand =	C_R = ___ pch
Available Reserve =	$M_1 - C_R$ = ___ pch
Delay & Level of Service (Table 3)	☐
Step 2 **Left Turn from B**	B_L
Conflicting Flows = M_H = (from Fig. 1)	A_R + A_T = 37 + 381 = 418 vph
Critical Gap from Table 2 T_g =	5.0 sec
Capacity from Fig. 2 =	$M_{No} = M_2$ = 780 pch
Demand =	B_L = 70 pch
Capacity Used =	$100 (B_L/M_2)$ = 9 %
Impedance Factor from Fig. 3 =	P_2 = 0.92
Available Reserve =	$M_2 - B_L$ = 710 pch
Delay & Level of Service (Table 3)	No Delays A
Step 3 **Left Turn from C**	C_L
Conflicting Flows = M_H = (from Fig. 1)	½A_R + A_T + B_L + B_T = 19 + 381 + 64 + 304 = 768 vph
Critical Gap from Table 2 T_g =	6.5 sec
Capacity from Fig. 2 =	M_{No} = 325 pch
Adjust for Impedance	$M_{No} \times P_2 = M_3$ = 299 pch
___ No Shared Lane Demand =	C_L = ___ pch
Available Reserve =	$M_3 - C_L$ = ___ pch
Delay & Level of Service (Table 3)	☐
✓ Shared Lane Demand =	$C_R + C_L = C_{RL}$ = 54 pch
Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = 606 pch
Available Reserve =	$M_{13} - C_{RL}$ = 552 pch
Delay & Level of Service (Table 3)	No Delays A

Overall Evaluation ___

Unsignalized "T" Intersection Capacity Calculation Form

Intersection KENNEDY DRIVE & MIDDLE DRIVE EAST (SKEWED T)

Location Plan:



Counts:
Date 4/16/82
Day Friday
Time 4:35 to 5:35 PM
Control YIELD
Prevailing Speed 30 mph +

Hourly Demand Traffic Volumes from 4:30 to 5:30 P m

Approach	A		B		C	
Movement	A_T →	A_R ↘	B_L ↱	B_T ←	C_L ↘	C_R ↱
Volume	359	57	141	941	51	108
pch (see Table 1)			155		56	119

Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2}A_R + A_T =$ 29 + 359 = 388 vph
	Critical Gap from Table 2 T_g =	5.0 sec
✓	Capacity from Fig. 2 =	$M_{No} = M_1 =$ 810 pch
___	Shared Lane – See Step 3	
___	No Shared Lane Demand =	C_R = ___ pch
	Available Reserve =	$M_1 - C_R$ = ___ pch
	Delay & Level of Service (Table 3)	☐
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	$A_R + A_T =$ 57 + 359 = 416 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{No} = M_2 =$ 790 pch
	Demand =	B_L = 155 pch
	Capacity Used =	$100 (B_L/M_2)$ = 20 %
	Impedance Factor from Fig. 3 =	P_2 = 0.85
	Available Reserve =	$M_2 - B_L$ = 635 pch
	Delay & Level of Service (Table 3)	No Delay A
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	$\frac{1}{2}A_R + A_T + B_L + B_T =$ 29 + 359 + 141 + 941 = 1470 vph
	Critical Gap from Table 2 T_g =	6.5 sec
	Capacity from Fig. 2 =	M_{No} = 100 pch
	Adjust for Impedance	$M_{No} \times P_2 = M_3$ = 82 pch
✓	No Shared Lane Demand =	C_L = 56 pch
	Available Reserve =	$M_3 - C_L$ = 26 pch
	Delay & Level of Service (Table 3)	Very Long Delays E
	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = ___ pch
___	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = ___ pch
	Available Reserve =	$M_{13} - C_{RL}$ = ___ pch
	Delay & Level of Service (Table 3)	☐

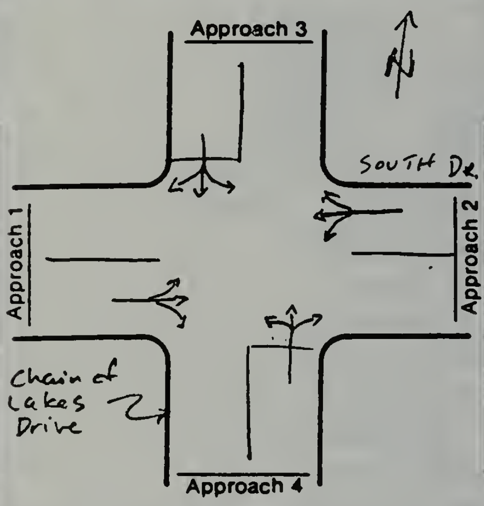
Overall Evaluation Low LOS on Middle Drive East, operating at over 2/3 capacity after adjusting for impedance on Kennedy.

Critical Movement Analysis: PLANNING
Calculation Form 1

Intersection South Dr. at Chain of Lakes East **Design Hour** 7:30 - 8:30 AM

Problem Statement Capacity and Level of Service Calculation

Step 1. Identify Lane Geometry



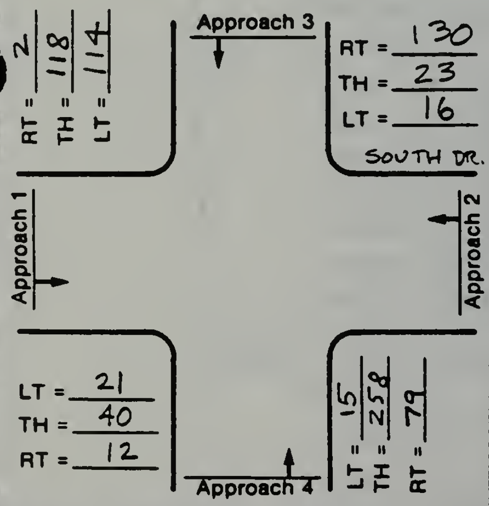
Step 4. Left Turn Check

	Approach 1	Approach 2	Approach 3	Approach 4
a. Number of change intervals per hour	40	40	40	40
b. Left turn capacity on change interval, in vph	80	80	80	80
c. G/C Ratio	.45	.45	.55	.55
d. Opposing volume in vph	153	61	337	120
e. Left turn capacity on green, in vph	387	479	323	540
f. Left turn capacity in vph (b + e)	467	559	403	620
g. Left turn volume in vph	21	16	114	15
h. Is volume > capacity (g > f)?	No	No	No	No

Step 6b. Volume Adjustment for Multiphase Signal Overlap

Probable Phase	Possible Critical Volume in vph	Volume Carryover to next phase	Adjusted Critical Volume in vph
	20		

Step 2. Identify Volumes, in vph



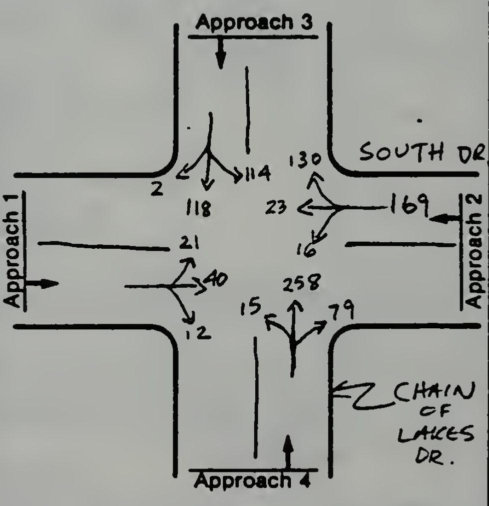
Approach 3: RT = 2, TH = 118, LT = 114

Approach 2: RT = 130, TH = 23, LT = 16

Approach 1: LT = 21, TH = 40, RT = 12

Approach 4: LT = 15, TH = 258, RT = 79

Step 5. Assign Lane Volumes, in vph



Step 7. Sum of Critical Volumes

114 + 16 + 258 + 40

= 428 vph

Step 8. Intersection Level of Service

(compare Step 7 with Table 6)

A

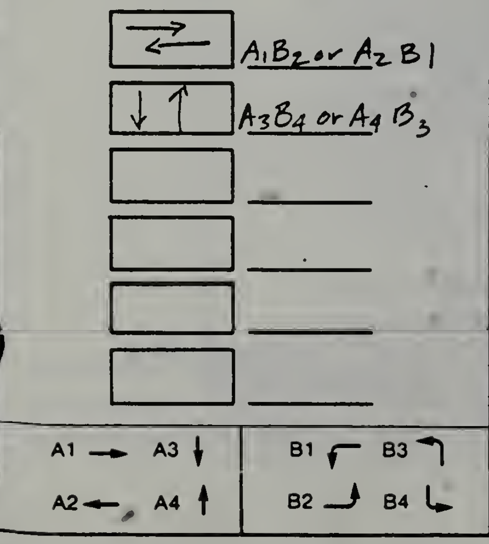
Step 9. Recalculate

Geometric Change Non

Signal Change Req'd

Volume Change

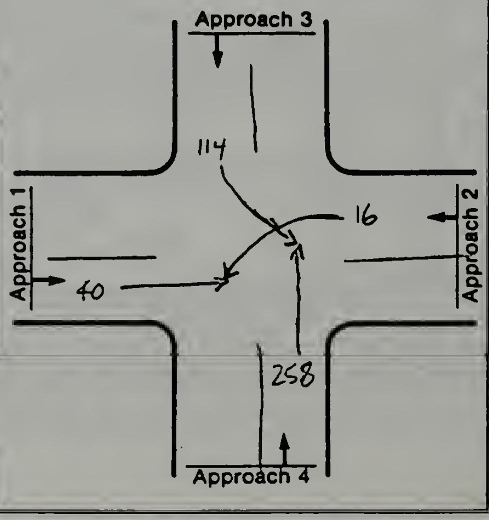
Step 3. Identify Phasing



A_1B_2 or A_2B_1

A_3B_4 or A_4B_3

Step 6a. Critical Volumes, in vph (two phase signal)



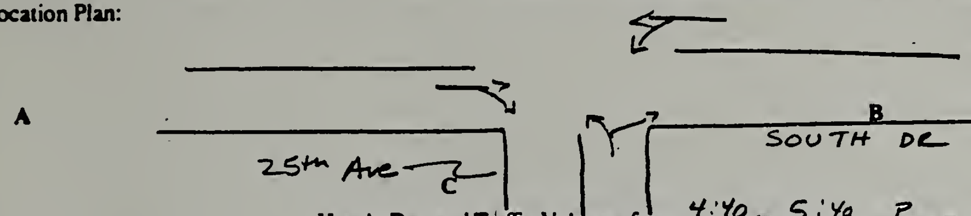
Comments

Assumes a two phase signal with green cycle priority to Chain of Lakes Drive. LOS at intersection would be A.

Unsignalized "T" Intersection Capacity Calculation Form

Intersection SOUTH DRIVE AT 25th AVE.

Location Plan:



Counts:
Date 6/22/82
Day Tues
Time 4:40 – 5:40 Pm
Control Stop
Prevailing Speed 30 mph

Hourly Demand Traffic Volumes from 4:40 to 5:40. P m

Approach	A		B		C	
Movement	A_T →	A_R ↘	B_L ↱	B_T ←	C_L ↰	C_R ↱
Volume	331	23	296	467	28	224
pch (see Table 1)			326		31	246

Step 1	**Right Turn from C**	C_R
	Conflicting Flows = M_H = (from Fig. 1)	½ A_R + A_T = 12 + 331 = 343 vph
	Critical Gap from Table 2 T_g =	6.0 sec
✓	Capacity from Fig. 2 =	$M_{No} = M_1$ = 650 pch
✓	Shared Lane – See Step 3	
___	No Shared Lane Demand =	C_R = ___ pch
	Available Reserve =	$M_1 - C_R$ = ___ pch
	Delay & Level of Service (Table 3)	___ ☐
Step 2	**Left Turn from B**	B_L
	Conflicting Flows = M_H = (from Fig. 1)	A_R + A_T = 23 + 331 = 354 vph
	Critical Gap from Table 2 T_g =	5.0 sec
	Capacity from Fig. 2 =	$M_{No} = M_2$ = 830 pch
	Demand =	B_L = 326 pch
	Capacity Used =	100 (B_L/M_2) = 39 %
	Impedance Factor from Fig. 3 =	P_2 = 0.69
	Available Reserve =	$M_2 - B_L$ = 504 pch
	Delay & Level of Service (Table 3)	No Delay A
Step 3	**Left Turn from C**	C_L
	Conflicting Flows = M_H = (from Fig. 1)	½A_R + A_T + B_L + B_T = 12 + 331 + 296 + 467 = 1106 vph
	Critical Gap from Table 2 T_g =	7.5 sec
	Capacity from Fig. 2 =	M_{No} = 140 pch
	Adjust for Impedance	$M_{No} \times P_2 = M_3$ = 97 pch
___	No Shared Lane Demand =	C_L = ___ pch
	Available Reserve =	$M_3 - C_L$ = ___ pch
	Delay & Level of Service (Table 3)	___ ☐
✓	Shared Lane Demand =	$C_R + C_L = C_{RL}$ = 277 pch
	Shared Lane with Right Turn Capacity of Shared Lane =	$M_{13} = \frac{(C_R + C_L)}{(C_R/M_1) + (C_L/M_3)}$ M_{13} = 397 pch
	Available Reserve =	$M_{13} - C_{RL}$ = 120 pch
	Delay & Level of Service (Table 3)	Long Delays D

Overall Evaluation Since it was assumed that no stops are on South Dr (stops are in place) LOS on South Dr. is probably lower ([illegible]), and LOS on 25th Ave for left turns is probably higher (C)

APPENDIX 6

ACCIDENT SUMMARY

FOR PERIPHERAL LOCATIONS

APPENDIX G

ACCIDENT SUMMARY FOR PERIPHERAL LOCATIONS

LOCATION	# ACCIDENTS 1976 - 1981	# INJURIES
Arguello Blvd. at Fulton St.	45	40
10th Avenue at Fulton St.	28	18
25th Avenue at Fulton St.	81	51
Park Presidio By-Pass at Fulton St.	83	64
30th Avenue at Fulton St.	10	3
43rd Avenue at Fulton St.	29	28
Great Highway at Kennedy Drive	35	35
South Dr. at Lincoln Way	10	7
Chain of Lakes Dr. at Lincoln Way	2	2
25th Avenue at Lincoln Way	34	21
Crossover Dr. at Lincoln Way	143	89
9th Avenue at Lincoln Way	57	22
Kezar Dr. at Lincoln Way	22	17
Arguello Blvd. at Frederick St.	9	5
Stanyan St. at Oak St.	9	3
Stanyan St. at Fell St.	7	2
Stanyan St. at Kennedy Dr.	22	2

23462

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